

Final Report Submitted To the Great Lakes Commission (modified)

1. Summary of tasks completed this reporting period

Fluvial Geomorphology Ditch Demo

- Cooperative agreements entered with landowners. Survey, design and construction completed on Needles creek demonstration project. Project monitoring was initiated and is on going.

Urban Storm Water Specialist Grant

- Competitive grant program offered for Urban Storm Water Specialists positions within urbanizing Lake Erie Counties resulting in approved positions in Lake, Lucas, Cuyahoga, Medina and Geauga Soil and Water Conservation District Offices. Training initiated and storm water specialists begin serving Phase II and other communities.
- Urban Storm Water Specialists in Lucas, Lake, Cuyahoga and Geauga provide erosion and sediment control services to county and municipalities and technical assistance regarding construction site erosion control. Additional SWCD staff provides this service in Medina counties.
- Urban Storm Water Specialists promote construction site erosion and sediment controls (CSE), water quality storm water practices and improved stream management, which protect water quality and stream integrity in Lucas, Lake, Cuyahoga, Medina and Geauga Counties.

2. Summary of accomplishments during this reporting period

Note: Please add as many letters as you need for your accomplishments in this period.

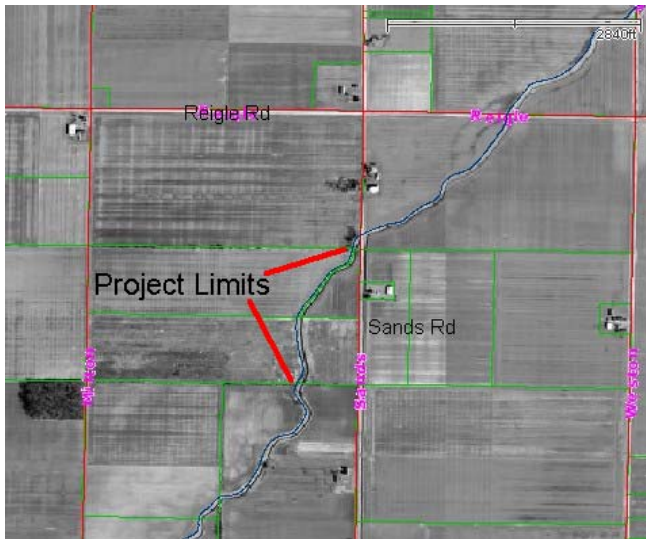
A: Fluvial Geomorphology Project:

This project constructed approximately 1500 feet of 2-stage channel in a previously modified reach of Needles Creek. The object of the 2-stage form was to construct a channel incorporating features of a naturally evolved channel, while constructing an overall capacity that provides for necessary drainage purposes. It is hypothesized that this type of construction offers ecological benefits in terms of water quality and channel morphology and also economic benefits if channel work is decreased over time. Once constructed the project will be monitored over the long term for biological, water quality (including sediment) and hydraulic parameters. This project was performed in coordination with other drainage channel demonstrations aimed at improving channel integrity and maintaining flow capacity in Ohio and Michigan and is being monitored under these efforts by the Ohio State University.

Modified channels often develop additional morphological character as sediment deposits within the cross section of the channel. These features are typically benches that are naturally formed and vegetated. Resulting

channels represent a more naturalized form having a narrower low flow or 1st stage channel. These more naturalized channels often segregate sediments, with coarser substrates left in the main flow path and finer material incorporated into the vegetated benches. Despite the potential benefits, these resulting channels are considered a negative by agricultural landowners as they typically reduce overall flow capacity compared to the originally designed or built channels. For this reason, the project demonstrated the construction of a channel with both the benches and a wider cross-sectional area to maintain the overall channel capacity over time. It should be noted that this demonstration is focused on a previously modified and maintained channel, not a natural stream.

Publicly owned sites with appropriately sized ditch channels were sought and an ODNR-Division of Wildlife parcel was selected in Jackson Township, section 34 of Wood County. This site is located Southeast of Hoytville, Ohio, The site is Southeast of the intersection of Sands and Reigle Roads (see map). The project consisted of work through the ODNR property and that of an adjacent landowner, Allen Bowers. Needles Creek, last modified in 1991-92, ran through these parcels and



represented a good site, since previous biological monitoring had been performed on the stream and it would likely be proposed for clean out in the near future.

Figure 1 Project location

The Wood County Engineer's Office staff, D.J. Mears, oversaw the project work locally. ODNR (Dan Mecklenburg) and OSU (Dr. Andy Ward) with Wood County personnel completed the design of

the new channel. Physical measures of similar ditches in the upper reaches of the Portage River, specifically formation of bench and channel features adjusted for their drainage area, were used to create a target cross-sectional shape for Needles Creek. Spreadsheets with data from reference sites have been submitted to the Great Lakes Commission and generally labeled "A-O={name of channel}".

This site drains approximately 11.5 mile². During construction the channel cross section was extended an average of 26 feet beyond the original width leaving low benches within the larger new channel. These benches could be applied to both sides of the channel or as demonstrated in this project, to one side only. The contractor, Apple Construction and

Excavating of Bowling Green, primarily used a tracked excavator and pan to remove earth from the cross section of the ditch. The contractor completed construction in October 2003 and was paid \$32,999. This project represents the upper range of applicable drainage areas, given that cost increases with drainage area as ditches get wider and significantly deeper. Shallower ditches offer greater opportunity due to reduced cost of excavation. Another project also completed in Wood County with a substantially smaller drainage area (~1 mile²) had a construction cost of about \$2.3 per linear foot compared to the \$22 per linear foot of this site. Of course, where the ditch is under maintenance, much of that cost would be considered the normal cost of dredging or reconstruction paid for by landowners.

A cross section showing the more typical pre-project and new channel forms is shown below (figure 2). This information comes from the spreadsheet submitted to the Great Lakes Commission titled "2 Stage Glen Rader Ditch". It should be noted that while the target cross-section may include benches on both sides of the channel, this site demonstrates gaining nearly all the additional width on one side. A 100' section at the upstream end of the project was widened with no benches left, to allow comparison of over-widening (where sediment deposition would build benches) versus where benches were established.

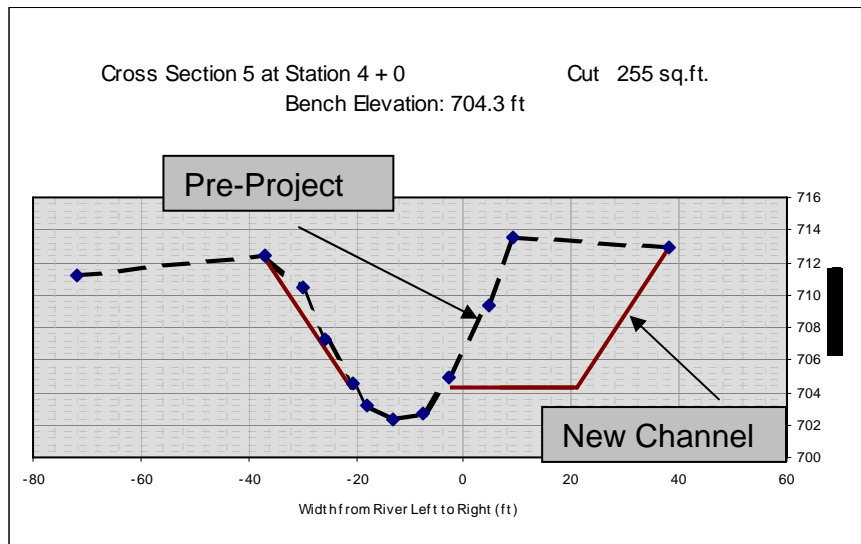


Figure 2 Cross section showing pre-construction and post construction channel form

Design aids and regional relationships taken from local channels were incorporated into design spreadsheets developed during this and similar projects in NW Ohio and Michigan. These evaluation and design aids are available on ODNR-DSWC's website and were also submitted to the Great Lake Commission. These spreadsheets aid in design and evaluation of relative changes in channel parameters such as flow,

sediment movement and shear stress as changes are proposed. These spreadsheets are described further below.

The Needles Creek project will continue to be monitored through cooperative efforts of ODNR and OSU. This project joins an additional project in Wood County (Fast Road) and Hillsdale, Michigan in exploring the potential to improve stream integrity while maintaining flow capacity. While riparian buffers treat sheet flows from areas adjacent to a ditch, often they don't utilize the dynamics of near-channel floodplains to be sediment sinks or receivers for the runoff from the entire drainage area. The 2-stage project is demonstrating these dynamics by providing additional active floodprone area within the channel. This project is an application of the relationship of channel morphology to sediment movement and shows further promise, as sediment issues are an increasing part of TMDL watershed modeling and plans. Increasingly models will need to go beyond pollutant loading and consider both the relative potential of near channel areas to contribute or capture sediments.

Given the large amount of continual work spent to maintain drainage capacity in modified channels, there are significant opportunities to improve integrity during already planned channel maintenance. This idea of "piggybacking" on already planned work needs outside funding since the landowners primary objective is drainage and not ecological gain. The experience of these projects shows that efforts to maintain drainage will be pursued by landowners, and will often be paid for by tax assessments, yet providing additional benefits such as increased channel stability, sediment deposition or improved habitat or water quality needs additional funding outside the individual landowners to add increased resource integrity.

While these additional benefits don't substitute for the quality or dynamics of a natural channel (2-stage ditch designs are not appropriate for natural channels), providing these benefits on modified channels may represent significant gains for a water resource. Since the watershed as a whole or downstream water resources reap these benefits, further efforts need to be made to help pay the additional cost of these improvements on managed channels. ODNR-DSWC will continue to explore the potential and opportunity of engineering and financing additional ecological gains in these highly maintained single stage ditches. Ultimately this may envision developing funding to pay the additional cost beyond the drainage component, of adding water quality and ecological benefits.

ODNR-DSWC is utilizing this experience to propose alternatives in other ditch projects. In some cases, the cost may not be significant and this type of construction or maintenance could become a regular alternative considered in planning, design and reviews. Presently these alternatives

are not usually considered until very late in the process and therefore are not usually considered a viable choice. Utilizing this type of alternative as an option for limiting environmental impacts during ditch maintenance and construction should be a regular aspect of ODNR ditch reviews.

The Wood County 2-stage Ditch site has been utilized and will continue to be used with field visits by visiting faculty (June 2004, University of Maryland) and other State and County staff (Feb. 20, 2004 site visit with ODNR DOW and Lucas SWCD staff) and as an example in other discussions of ditch and channel modifications and maintenance (Gries Ditch Meeting Sandusky County Feb. 2004). ODNR expects that it will continue to serve this function.

Project task force: Wood County Engineers with assistance from OSU, ODNR-DSWC provided survey and design (May-August 2003). Onsite meetings were held as well as phone and email correspondence regarding site data and design features.

A working agreement was entered with the Wood County Engineers and ODNR-DSWC for cooperation and to pay for additional costs of designing and constructing a 2 stage channel.

A landowner cost-share agreement was established with the primary private landowner, Allen Bowers.

Pre-construction Monitoring: ODNR-Division of Wildlife performed habitat and fish survey. On June 11, 2003 ODNR Division of Wildlife electro-fished a 200 m section of Needles Creek (41.1760986 N 83.8153612 W) that falls into the reconstructed area using standardized Ohio EPA methodology. A total of 15 species of fish were captured with the most abundant species being blackstripe topminnow (175 individuals), followed by fathead minnows (166 individuals) and bluntnose minnows (143 individuals). The largest individual fish was a common carp weighing 2151 grams. The reach was also evaluated using the Qualitative Habitat Evaluation Index prior to construction (score sheet attached). The reach showed largely silt substrates with some gravels, moderate embeddedness and appeared to be in a recovering stage from the last channelization work.

Ohio State University also initiated monitoring after construction measuring stage and flow as well as nutrient. This monitoring was initiated the spring of April of 2004 continues until now. Unfortunately this data has not been fully evaluated. Excel spreadsheets with the current raw data were submitted to GLC.

As mentioned above, numerous tools have been developed as a result of the work done on Needles Creek and related projects. The development of the STREAMS MODULES (Excel evaluation and design spreadsheets) listed below benefited from the experience gained from the fluvial geomorphology project and are available at the ODNR-DSWC website at <http://www.dnr.state.oh.us/soilandwater/streammorphology.htm>.

A description of some of these tools is also provided below:

Reference Reach Spreadsheet for reducing channel survey data and calculating basic bankfull hydraulic characteristics

Regime Equations for determining the dimensions of typical channel form Meander Pattern that dimensions a simple arc and line best fit of the sine-generated curve,

Cross-section and Profile that can be used to illustrate the difference between existing and proposed channel form

Sediment Equations which includes expanded and condensed forms of critical dimensionless shear, boundary roughness and common bed load equations

Contrasting Channels that computes hydraulic and bed load characteristics in a side-by-side comparison of two channels of different user defined forms.

B: Urban Storm Water Specialist Competitive Grant developed offered and approved for 5 Lake Erie Urbanizing counties.

Overview- In 2002, the **urban storm water specialist program** was initiated by requesting proposals from Soil and Water Conservation Districts in the Lake Erie Watershed interested in position funding support. The positions would assist in developing and implementing storm water management plans required under the NPDES (National Pollutant Discharge Elimination System) Phase II program and would focus on practical steps limiting negative impacts of new and existing development on water resources such as improving management of construction site erosion/sediment controls, storm water management, stream management, and public facilities. Financial support for the program was a combination of State general revenue, Great Lakes Commission Funding and federal Coastal program funds.

Initiating these technical assistance positions offered numerous advantages for the state and local communities alike. First, the program potentially could jump start many programmatic efforts and their environmental benefits. For instance, specialists began providing provide immediate construction site plan reviews, inspection, erosion and sediment control education in municipal and township areas that otherwise may have taken 2 years to begin such efforts. Additionally specialist's workplans contained other items such as post-construction training or channel assessments, which assist local government in advancing beyond typical NPDES permit activities to better storm water and stream management.

Prior to approval of proposed applications, the Soil and Water Conservation District and the local governments were asked to commit to the long-term financial support for the positions in exchange for the initial financial support for the position through the ODNR Division of Soil and Water Conservation. Four years of financial support would be provided, starting at \$40,000 and decreasing \$5000 each year (\$135,000 total). These positions are expected to be continued in the long term, with ODNR-DSWC state funds matching of local governments funds within a Soil and Water Conservation District budget.

SWCDs submitted proposals that included: a proposed budget including local financial or in-kind support; a preliminary work plan; letters of support and financial commitments from partner communities supporting the Urban Storm Water Specialist; description of the partner communities' water resources (the focus of the storm water management plans) and their impairments; a description of the local Phase II efforts; and the minimum qualifications for the proposed storm water specialist. After review of applications, Lucas, Lake, Cuyahoga, Geauga and Medina were

selected to receive urban storm water specialist funding. The following are the personnel that have been hired or designated to be the storm water specialists: Lucas SWCD -Jeff Grabarkiewicz; Cuyahoga SWCD – Todd Houser; Medina SWCD – Carla Regener, (since replaced by Gary Norcia); Geauga SWCD – Nagasekhar Gorla; and Lake SWCD – Brett Rodstrom.

Provided with orientation and training through the ODNR Division of Soil and Water Conservation and other venues, the specialists have a natural resource based approach that incorporates a better understanding of stream morphology and watershed management than is typical in communities trying to comply with the federal NPDES permit program. The specialists practice channel assessment techniques along with promoting storm water management (quantity and quality) and erosion and sediment controls. ODNR-DSWC believes that this multi-disciplined approach will accomplish better resource improvement and be able to modify program direction in response to the needs of the water resource. Watershed Training was provided via the Connecting Ohio Watersheds meetings; Urban Water Quality Training September 24, 2003 by John Mathews; Stream Morphology Training via STREAMS Conference and Workshops October 6, 7, and 8, 2003; Basic Stream Morphology training November 12 and 13, 2003, and basic technical training was provided through the ODNR-DSWC Technician Development Program. The storm water specialists also participated in and help to organize Storm Water Detention and Water Quality Training sessions April 29, 30 and May 21, 2004.

Storm water specialists work closely with local government partners and the development community to provide construction site plan review and inspection, planned educational programs and water resource evaluations. Our experience has shown that local personnel given this type of well-rounded training and work plan responsibility are better equipped to consider and strategically pursue continual improvement in local programs influencing water resources. The specialists also work closely with state partners such as the Ohio EPA storm water field personal, responsible for enforcing NPDES permits, thus establishing lines of communication regarding developing sites and local approaches.

C: Activities of Urban SW Specialists:

Cuyahoga

Since the spring of 2003, Todd Houser has been employed as a urban storm water specialist to assist NPDES phase II communities in

implementing their requirements. Mr. Houser's first efforts were to establishing working agreements with communities to provide services such as construction site erosion control plan review, site inspection and other phase II implementation goals. As relationships with municipalities have become established, Mr. Houser began to work on additional storm water issues like program administration, post-construction water quality treatment and potential demonstration projects.

Assistance was initiated and continues to support ***codification and adoption of local ordinances*** for construction site erosion and sediment control, storm water quantity, storm water post-construction quality and riparian/wetland setbacks for the following communities Middleburg Heights, Rocky River, Bratenahl, Fairview Park, Broadview Heights, North Royalton, Parma and Moreland Hills.

Completed 42 ***erosion and sediment control plan reviews*** for proposed developments with corresponding concerns and comments to local government and owner/developer. To a lesser degree, the urban storm water specialist also assists with reviews of county/township sites, which are performed primarily by other field office personnel.

Provided in excess of 70 ***construction inspections*** with associated communication with onsite personnel, local government representatives and the owner/developer.

Have provided continual assistance to 8 local municipalities in the formation and ***administration of their construction/post-construction pollution prevention programs***.

Provided ***storm water pollution prevention training*** for engineering, building and service department personnel (includes construction erosion control) for 6 municipalities. Organized 3 storm water detention design (including post-construction storm water) seminars for public and private engineers in April-May of 2004. Agendas are attached.

Provided ***technical assistance*** to the public regarding stream instability, soil stabilization, construction site erosion or storm water issues at the average rate of 5 per month.

Lucas

Jeff Grabarkiewicz is the urban storm water specialist in Lucas County. Because Lucas County does not have established local requirements in the county or municipalities, Mr. Grabarkiewicz has promoted a combination of education of designers, developers and public officials and construction site plan review and inspection. Additional efforts have been

applied to promote natural channel stability, positive floodplain function and enhanced storm water controls.

Completed 39 **preliminary site plans and erosion and sediment control plan reviews** for proposed developments with corresponding concerns and comments to local government and owner/developer.

Provided in excess of 101 **construction inspections** with associated communication with onsite personnel, local government representatives and the owner/developer.

Have provided **assistance in storm water** concept development, design or retrofit: Maumee Valley Country Day school (bioretention design and education for parking lot flows); Grant writing for retrofit for mall parking lot detention pond with County Engineer (proposed for Feb 2005); Conceptual plans for a proposed Clean Ohio grant for streamside property acquisition by a township; Revision of Stormwater Standards Manual (construction practices portion); Have assisted City of Sylvania and Toledo Metroparks with proposal to install constructed wetland to attenuate flow and treat runoff from nearby street.

Provided storm water and creek **presentations** for county, municipal and public audiences including construction site erosion and sediment control workshop for the Lucas County Home Builders Association and the organization of a wetland regulations workshop for developers, township zoning, county agencies.

Provided **technical assistance** to the public regarding stream instability and management, construction site erosion and stabilization or storm water issues at the average rate of 6 per month.

Geauga

Nagasekhar Gorla is the urban storm water specialist in Geauga County. Mr. Gorla has been focused on providing GIS mapping of storm water outfalls and facilities, construction site inspection and investigating the potential of applying low impact development to Geauga County development projects. Besides mapping, erosion and sediment control priorities, Mr. Gorla's work will also focus on proper maintenance and discharge from SW basins to protect streams from erosion.

Storm Sewer Outfall Mapping: This project included delineating the Chagrin watershed into 11 small sub-watersheds, designing a naming convention to be followed for streams, tributaries and outfalls (figure 2), obtaining and labeling hydrography for each NPDES Phase II community. Information about outfall locations and associated streams is entered into

a database and being tied into the county GIS system. Currently there are 1677 outfalls to various streams identified. Storm sewer outfalls are summarized by township in figures 3 & 4 respectively. Storm sewer outfall maps are shown in figures 5-8. Field verified outfalls are highlighted with yellow color points.

Stormwater Basin Database/Mapping: Information was gathered through the Public Access System (PAS), field visits, and old records to develop a map of existing storm water basins using Arc View GIS and is regularly being updated, as new storm water basin information is available. User-friendly forms and reports (Figure 10) for storm water basin database were also created to enable Geauga SWCD to regularly inspect and monitor basins to ensure their originally designed function. The database will continue to be updated throughout 2004.

Advanced Stormwater Management: The urban storm water specialist has collected information about possible alternate structural and non-structural measures to control storm water runoff such as Low Impact Development (LID). The applicability of these approaches are being considered for Geauga County.

A total of 127 **construction site inspections** (City Of Chardon and Bainbridge Township) and 10 construction site erosion control plans and 5 storm water management plans have been performed by the urban SW specialist. This work complements work by other SWCD staff on development plan review and site inspection in this and other locations.

Lake

Brett Rodstrom is the Urban Storm Water Specialist in Lake County. His primary work consists of ***construction site plan review and inspection***, and follow-up with problem sites, but he also gives technical assistance regarding storm water pollution control, stream health and stream stability.

Construction Site Plan Review and Inspection: Over the past year, Mr. Rodstrom has performed: plan reviews for 17 large residential or commercial developments and 343 individual home sites; and 372 construction site inspections on large commercial or residential developments and 2319 inspections on individual home sites. Mr. Rodstrom also initiated a strategy with the county prosecutor to address problematic individual home sites here with repeated non-compliance with erosion and sediment rules resulting in improved compliance.

Review & inspection for ESC plans is provided for 5 townships in conjunction with the Lake County ESC Ordinance (1999) and for 4 other communities (Willoughby Hills, Willoughby, Wickliffe, and Kirtland) which

have passed Phase II compliant ESC ordinances for which the District administrates completely. Other communities (Mentor-on-the-Lake and Perry Village) are working to pass an ESC Ordinance that the District will administrate by the end of 2004. Additional assistance is being provided to Eastlake, Willowick, Fairport, and Grand River to encourage adoption of an ESC ordinance.

Post Construction Storm Water Assistance: continual assistance is provided to the Lake County Stormwater Management Department (SMD) on technical issues pertaining to Post Construction best management practice design. Mr. Rodstrom leads a bi-weekly meeting with County Engineer, Lake SMD, and Health Department to discuss specific development projects, education projects, and ideas for storm water management issues. An ESC and PCWQ BMP Guidance Manual was developed for assisting developers/engineers in developing site plans in Lake County (attached). Mr. Rodstrom also assisted the Chagrin River Watershed Partners with the creation of a Model Stormwater Ordinance to be used throughout Lake County and Northeast Ohio. It is available for viewing at www.crowp.org/crowpsm.doc. Assistance was provided with the development and implementation of practices on 34 proposed new residential or commercial projects in Willoughby Hills, Kirtland, Eastlake and in five Lake County Townships. Worked on a proposal with the City of Mentor-on-the-Lake for a wetland/floodplain expansion treatment system for 280 acres of urban stormwater in the Mentor Marsh Watershed.

Public Education: Assisted with two phases of the Headwater Stream and Watershed Sign Project affecting 45 stream crossings plus press releases and educational web links www.lakecountyohio.org/soil/stream/sign_project.htm. 2 homebuilder workshops were conducted (over 20 attendees) and a community service department workshop with over 40 attendees focused on construction site erosion and sediment controls. Assisted in biannual Stream Monitoring Program in May and September (about 800 students total).

Assistance with Floodplain, Riparian, or Wetland Issues: Assisted with Headwater Habitat Evaluation Index measurements in incorporated communities. Provided assistance to landowners on bank erosion and riparian improvement issues.

Assistance with Upgrading Community Standards: Kirtland Riparian Ordinance passed with Willoughby Hills and Mentor-on-the-Lake planned to follow before December 2004. Developed riparian building and sanitary setbacks for Lake County Planning Commission to be used on all new commercial/residential subdivisions in township communities.

Medina

Gary Norcia is the Urban SW specialist in Medina County, replacing Carla Regener, the originally hired storm water specialist. The Medina urban storm water specialist position is primarily responsible for facilitating NPDES phase II plan implementation. Additional efforts support the goal of riparian corridor protection, setbacks from channels during development and supporting healthy stable streams through technical assistance and education.

Phase II Implementation: Developed website structure and materials (<http://medinaswcd.org/streams.htm>), fact sheets, and newspaper articles to educate the public on streams, water quality and stormwater education. Held an average of 10 meetings per month with local government (phase II communities) to implement plans. Prepared annual phase II reports for communities to Ohio EPA.

Stream technical assistance: Stream owner workshop Assistance on private lands.

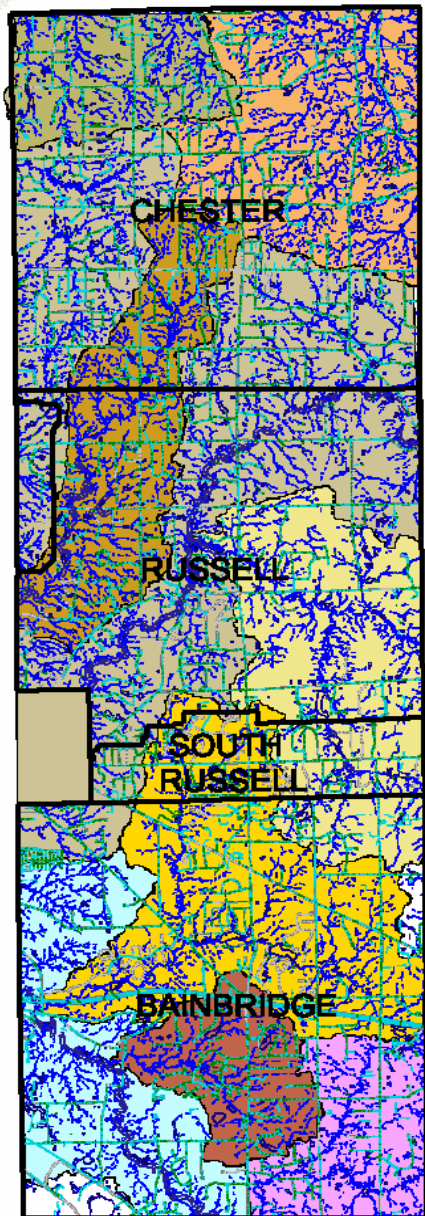
Riparian protection/setback: Provided an average of 1 presentation per month to the public about the benefits of streams and floodplains in receiving sediment and promoting stream health and stability.

Construction Site Plan Reviews: While other staff have provide primary review and inspection of erosion and sediment control, the storm water specialist specifically has been commenting on stream and floodplain impacts.

Geauga County Urban SW Specialist Figures



NPDES Phase II Communities



Hydrography

- Creek
- Ditch
- Hidden Drain
- Intermittent Creek
- Lake
- Pond
- River

Sub-watersheds

- Aurora-East Branch
- Aurora-West Branch
- Caves Creek
- Chagrin-East Branch
- Chagrin-Main Branch
- Griswold Creek
- Silver Creek
- Linton Creek
- McFarland Creek

4000 0 4000 8000 Feet



Figure 1. Sub watersheds in Phase II Communities

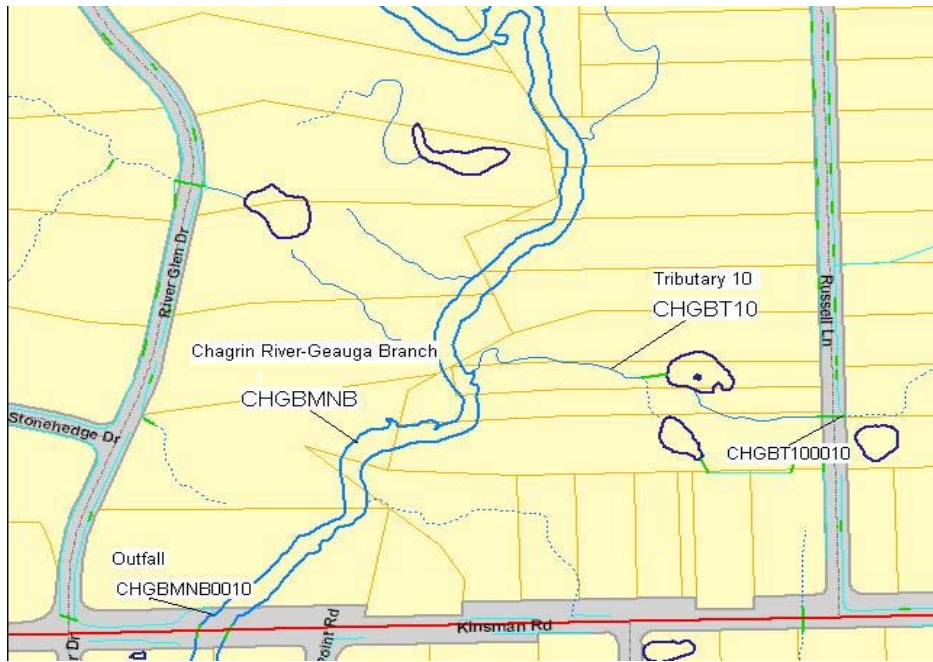


Figure 2. Numbering/Naming convention

Outfalls By Township

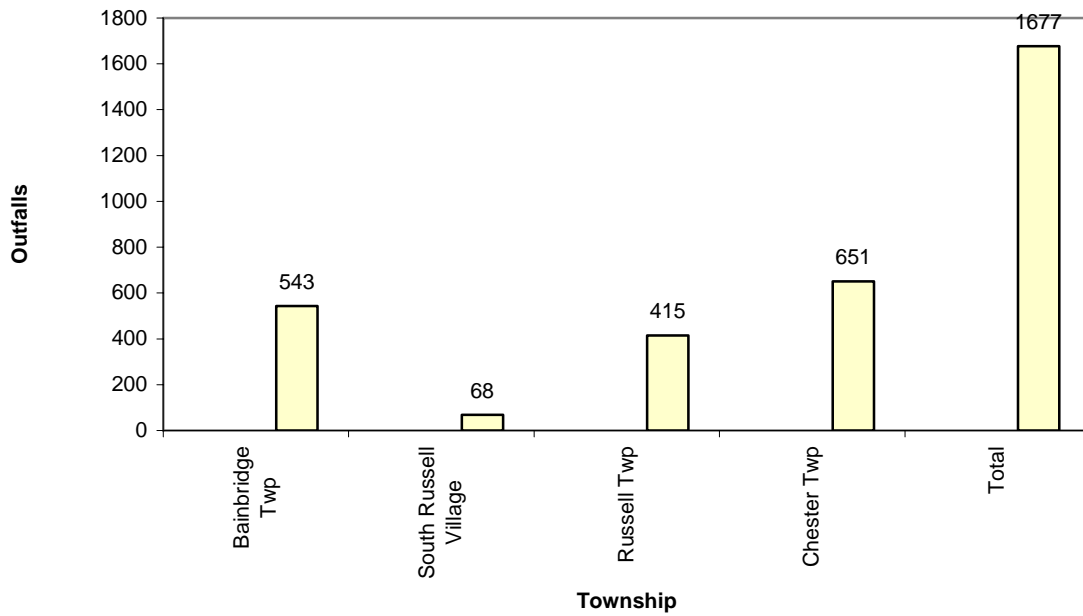


Figure 3. Storm sewer Outfalls By Township

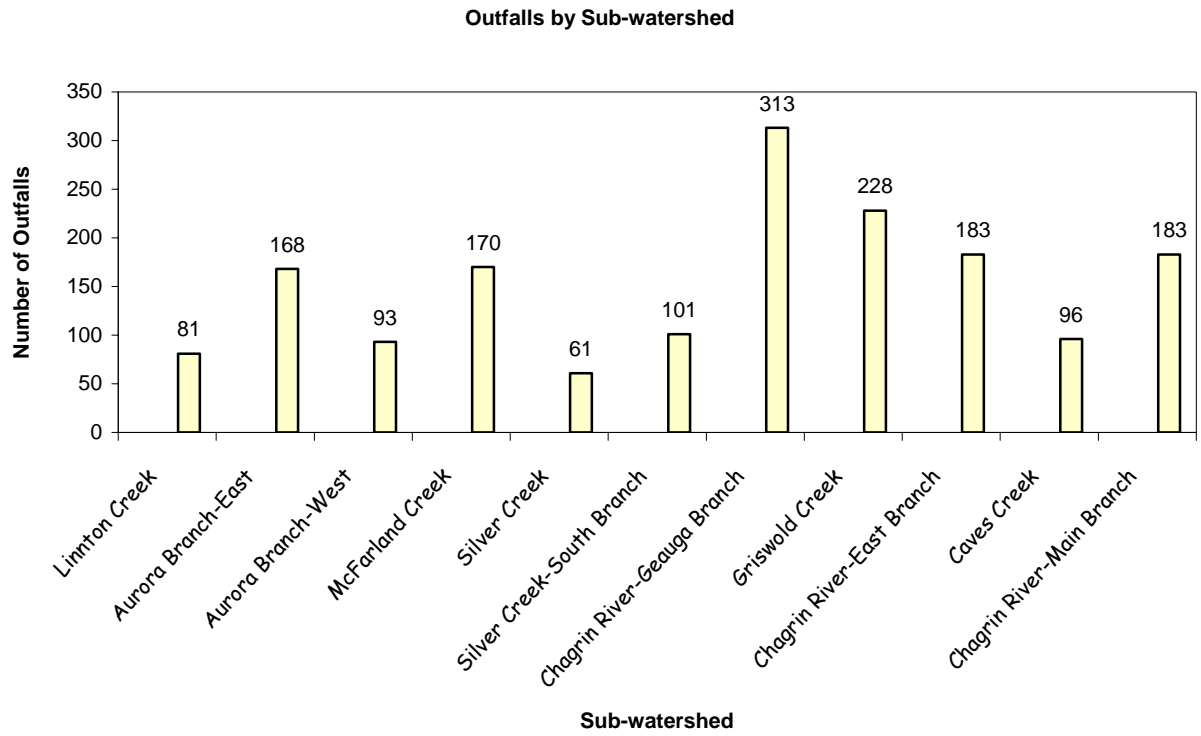
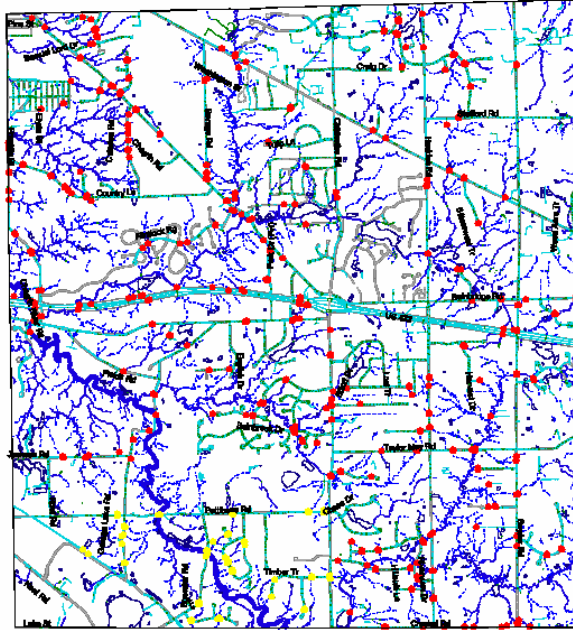


Figure 4. Storm sewer Outfalls By Sub watershed



Bainbridge Twp Storm Sewer Outfall Map



- Bnbboundary.shp
- BainbridgeOutfalls
- Hydrography
 - ↘ Creek
 - ↘ Ditch
 - ↘ Hidden Drain
 - ↘ Intermittent Creek
 - ↘ Lake
 - ↘ Pond
 - ↘ River
 - ↘ Roads

3000 0 3000 Feet



Figure 5. Bainbridge TWP Storm Sewer Outfall Map

Russell Twp Storm Sewer Outfall Map

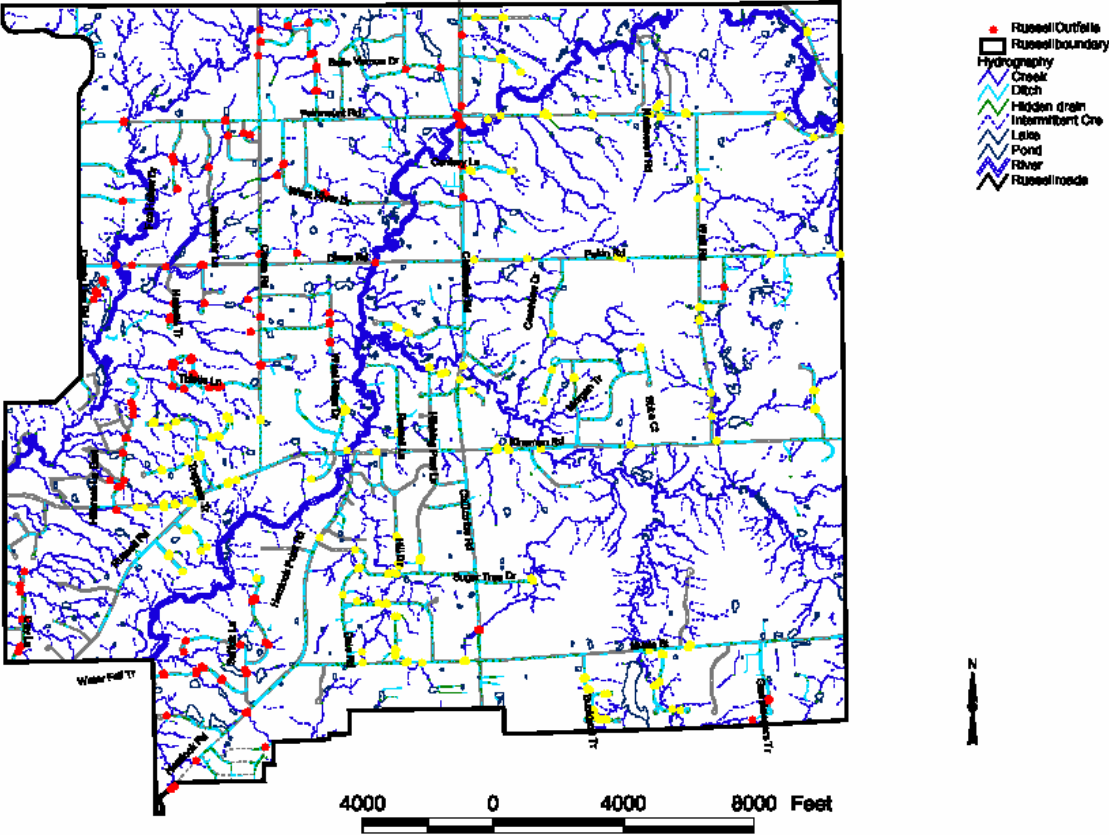


Figure 6. Russell TWP Storm Sewer Outfall Map



South Russell Storm Sewer Outfall Map



- SouthRussellOutfalls
- Hydrography
 - ~ Creek
 - ~ Ditch
 - ~ Hidden Drain
 - ~ Intermittent Creek
 - ~ Lake
 - ~ Pond
 - ~ River
- ▭ Srussealboundary.shp
- ^ Roads

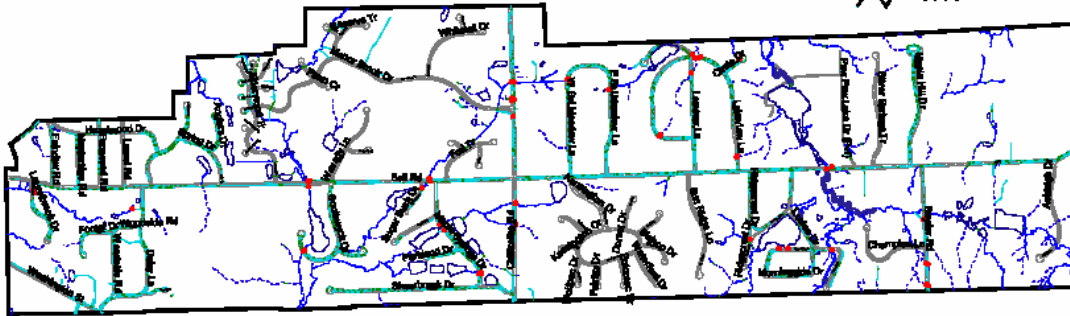


Figure 7. South Russell Village Storm Sewer Outfall Map

Chester Township Stormsewer Outfall Map

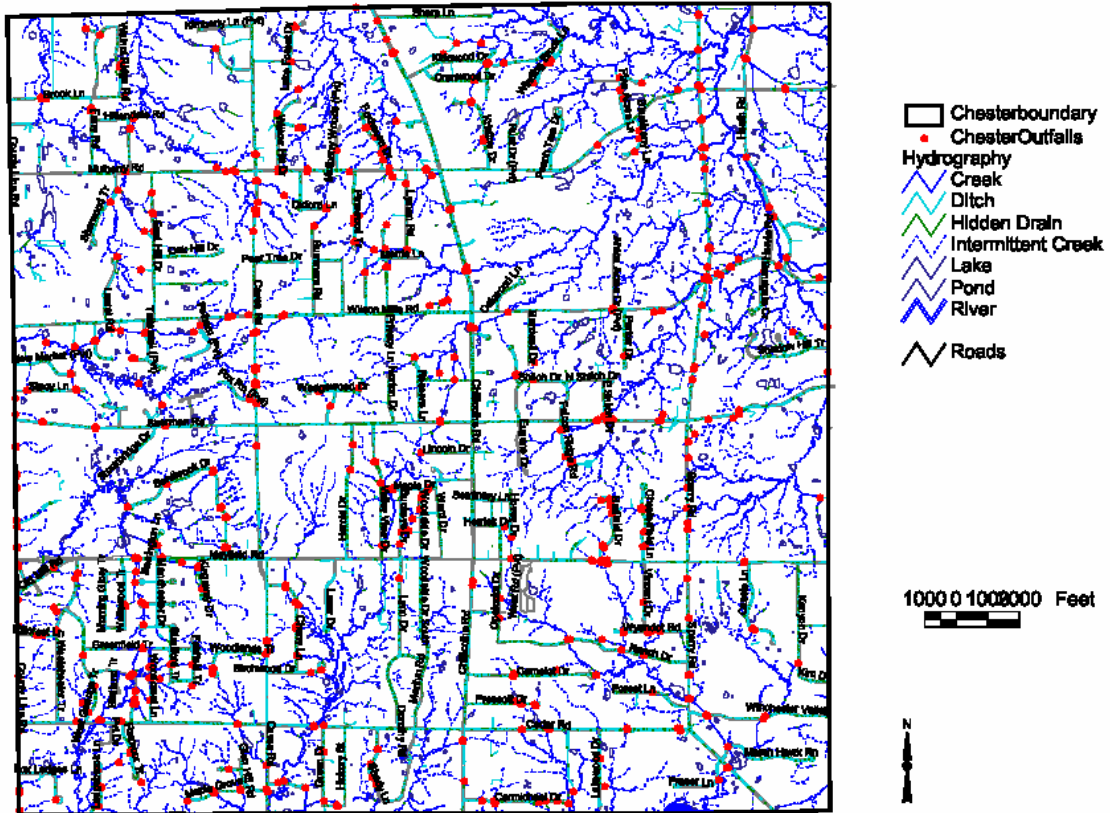
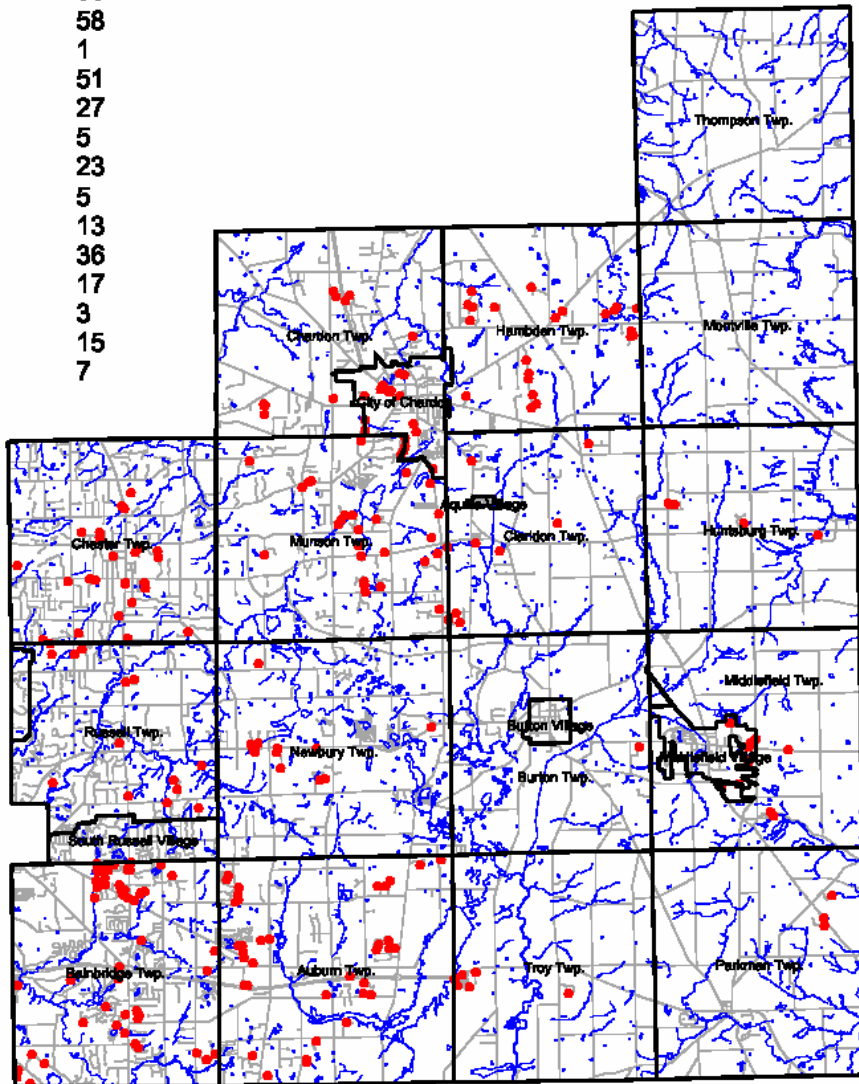


Figure 8. Chester TWP Storm Sewer Outfall Map

Geauga County Stormwater Basins

Auburn	38
Bainbridge	58
Burton	1
Claridon	51
Chardon	27
Chester	5
Hambden	23
Huntsburg	5
Middlefield	13
Munson	36
Newbury	17
Parkman	3
Russell	15
Troy	7




● Stormwater Basins (Total = 271)



Figure 9. Stormwater Basins in Geauga County


Microsoft Access - [Site]

File Edit View Insert Format Records Tools Window Help



Geauga County

Stormwater Detention Basin Database



Geauga County, Ohio

ID Year Built

Site Name

Location

Entrance Rd

Basin No

Condition


Lat-Long Coordinates (Deg min) **State Plane Coordinates**

North North

West East


Last Inspected

Remarks



[Get State Plane Coordinates](#)

NOTE: Click on the image to run ArcView GIS Program.



Record: 1 of 264

Form View

Start | NPDES Phase2 | EndOfYearR... | Figures.doc ... | ArcView GIS ... | Stormwater ... | Site | untitle - Paint | 10:16 AM

Figure 10. Stormwater Basin Data Entry/View form