St. Joseph River Watershed 319 Project
Road-Stream Crossing Subcommittee
August 19, 2003 Meeting Summary

Attendees

Chris Bauer, MDEQ
Allen Butchbaker, Cass County Drain Commission
Mark Kieser, Kieser & Associates
Joe Margol, Berrien County Road Commission
Sandra Nordmark, FOTSJR
Nicole Ott, Kieser & Associates
Kregg Smith, MDNR
Sarah VanDelfzijl, Rocky River Watershed
Bill Word, Hillsdale County Drain Commission

Mark Kieser led the meeting. The summary of the last meeting was reviewed and approved with the correction of the spelling of Allen Butchbaker's first name. The summary will be posted on the project website.

The erosion quantification form (Attached) was updated to include instructions on using key parameters to quantify sediment loading from streambanks and other sites or erosion, such as road crossings. The equation was presented and explained. The equation utilizes the geometry (height and length) of the eroding streambank. A severity index is used to determine the lateral recession rate. Alternatively, a series of aerial photographs can be interpreted or erosion can be compared to a stationary object over time to determine the lateral recession rate. It was asked whether this equation has been field tested. It was explained that it was obtained from MDEQ guidance for 319 watershed projects. Mark Kieser indicated that he led a project in the Kalamazoo River Basin where three methods for quantifying erosion were compared. Those methods included: one-half the gully erosion equation from USDA NRCS, use of the severity index to determine the lateral recession rate and use of aerial photographs to determine the lateral recession rate. He indicated that the two latter equations most accurately estimated sediment loading. The gully erosion equation overestimated loading.

The Subcommittee was asked whether they would prefer to adopt a whole new form for scoring/quantifying erosion or whether the key parameters for calculating loading could be added to existing forms. It was decided that it would be easier for field personnel to continue using the forms they were accustomed to with a few additional parameters included. Therefore, items included on the agenda referring to weighting of parameters and addition/deletion or parameters were not discussed because they dealt with the creation of new forms which both scored erosion sites and quantified sediment loading. It was noted that it would not take much additional time to complete the quantification parameters and that the most difficult part of the surveying is arranging to get staff out in the field. From a 319 project perspective, the supplemental information is more likely to be used by grantees than an additional form, considering the grantees are required to use the MDEQ form regardless. An additional form containing the parameters could be created for those who do not have an original form to work with.

In Berrien County the Road Commission conducts small surveys and hires consultants to conduct larger surveys. The consultants should have no problem surveying for the additional parameters. It was asked who identifies tree fall erosion and other types of instream erosion. Bill Word indicated that that task is not routinely performed and asked Sandy Nordmark whether the Friends would perform that activity. She

indicated that some of their Chapters remove litter and small limbs during their clean-up activities, but was unsure about larger woody debris. Most likely they do not because they do not own any heavy equipment. Bill Word also indicated that when tree falls occur in Hillsdale County they greatly affect the stream flow. Streams in Hillsdale County are all headwater streams with widths of four to twelve feet. Because they are so narrow, fallen trees can block the whole stream and cause erosion when the flow is forced to cut around the trees. Vertical banks result, which impact habitat by causing cover and shade to be lost.

It was indicated that an observation or comments section should be included on all forms and photographs should accompany the forms in order to communicate findings to those who have not seen the site. It was indicated that much work and money goes into controlling erosion from the land, but little is spent on correcting streambank erosion. The quantification parameters can form a basis for decision making so that erosion problems and habitat loss can be corrected. They can help to identify priorities and direct implementation funds.

The additional data collected by 319 grantees probably will not be incorporated into the MDEQ database. MDEQ staff often discuss how to incorporate additional data and how to make the data accessible to others. Most 319 grantees hand in a stack of hard copy data forms, which languish in the MDEQ offices waiting for an intern to enter the data into the database. It would be easier for the MDEQ if grantees could enter the data electronically. The FOTSJR invertebrate data entry program was cited as an example of a website in which those collecting the data can enter it directly into the database. It was asked whether a similar database could be created for erosion data. Chris Bauer indicated that that would be helpful for the MDEQ as beach monitoring data are entered in that manner.

If the data cannot be shared with all watershed stakeholders, does that prevent this quantification-approach from being broadly institutionalized in the basin? It's still valuable for individual agencies to collect quantification data. A spreadsheet which calculates loading could be distributed to workshop attendees. But if the data are only available inter-agency, what's the incentive to collect it? From a watershed perspective, it could aid the partners in updating the Watershed Management Plan to meet U.S. EPA requirements. It could also help watershed managers obtain Section 319 implementation funds. An example website documenting erosion sites along the Kalamazoo River was shared with the Subcommittee (http://www.kalamazooriver.net/tmdl/erosion_sites.htm). The pages contain photographs of the sites, a map of the site location and sediment and phosphorus loading information. It was agreed that a data sharing mechanism such as this would be helpful. However, it is beyond the scope of this project. It would be worthwhile to pursue additional funds to create an on-line database to share information as such. Kieser & Associates indicated that they have been pursuing such funding.

It may be useful to find examples of where quantifying erosion is beneficial. Kieser & Associates will visit Berrien and Hillsdale Counties to document sites under the jurisdiction of the Road Commission and Drain Commission, respectively. This quantification is also being field tested in the Rocky River Watershed and will be utilized in the Hog Creek Watershed. This quantification may help 319 projects conducted in Michigan and Indiana meet U.S. EPA requirements.

When reporting sediment loading from erosion sites, it may be valuable to also report the estimated cost to fix the problem or the associated costs with leaving the site as-is. This may be helpful for reporting and for

getting budgets to include streambank maintenance. From a fisheries perspective, even if the data are not shared across the watershed, any quantification beyond subjective observations is valuable regardless of the owner of the data. However, any group collecting the data should commit to collecting it over an appropriate time period to assess trends. Groups shouldn't just collect data for a year in order to obtain a grant and then discontinue if that grant is not awarded. This analogy may be compared to the MDNR creating a database to record locations of fish catches by the public. Fishermen may be able to enter the data themselves and have it displayed in real-time. Overall, such an approach would allow for the development and maintenance of a long-term tracking approach.

This quantification method could also be useful to NPDES Phase II communities who must meet permit requirements for stormwater discharges to surface waters. Other groups, such as soil erosion control officers, who would find this information useful should be identified to attend the workshop. In Hillsdale County, municipalities such as the Cities of Hillsdale and Litchfield must begin to address problems with stormwater outlets becoming silted in by sedimentation in the surface waters. This will ultimately exacerbate flooding problems.

Sandy Nordmark provided an update on the planning for the Watershed-wide Workshop. It will be held on Wednesday, November 5 from 8:30 to 12:30 at A Place In Time in Three Rivers, MI. A mini-vendor show will accompany the presentations. A fisheries biologist may present a PowerPoint program on culvert placement. However, Sandy has not reviewed this presentation. Sarah Vandelfzijl will provide a background on the Rocky River Watershed project. Gordon Porter will present on his work with the Branch County Road Commission. The majority of the workshop will pertain to the erosion quantification method.

The next meeting will be on September 30, 2003 from 1:00 p.m. to 3:00 p.m. at the St. Joseph County Conservation District in Centreville, Michigan.

Road Stream Crossing Inventory
Scoring for Erosion Quantification

SITE NUMBER_____
scores indicated in parenthesis

Stream Flow Type (check one)
_____ephemeral/dry (2) _____stagnant (2) _____slow/medium (1) _____high/scouring (3)
Average Stream Depth (check one)
____<3' (1) ____>3' (2)
Sedimentation Observed Downstream (check one)
____no (0) _____present (1) _____abundant (2)
Highest Water Mark over Current Water Level (check one)
___<1' (0) ____1-3' (1) _____3-10' (2) _____>10' (3)

Adjacent Road Surface (check one)
____paved (0) _____ gravel (1)
Gully/erosion observed from road?
___no (0) ____yes (2)

Riparian Vegetation Width Downstream (L) (check one)
___>100 (0) _____ 30-100 (1) _____10-30 (2) _____<10 (3)

Riparian Vegetation Width Downstream (R) (check one)
___>100 (0) _____ 30-100 (1) _____10-30 (2) _____<10 (3)

Riparian Vegetation Width Upstream (L) (check one)
___>100 (0) _____ 30-100 (1) _____10-30 (2) _____<10 (3)

Riparian Vegetation Width Upstream (R) (check one)
___>100 (0) _____ 30-100 (1) _____10-30 (2) _____<10 (3)

Stream Bank Slope (check one)
____1:1 or steeper (3) ____2:1 (2) _____ 3:1 (1) _____ 4:1 or flatter (0)

Soil Texture (stratified?, indicate approximate percentage of each soil type)*
____sand (3) ____gravel (2) ____ silt (1) _____clay (0)

SITE OF EROSION NOTED?
if yes, proceed with following observations; if no, proceed to total score
height of erosion site*
____<10' (1) ____10-20' (2) ____>20' (3) if measured, please include height_____feet
length of erosion site*
____<10' (1) ____10-50' (2) ____>50' (3) if measured, please include length_____feet
vegetation density on erosion site
_____50-100% (1) _____25-50% (2) _____<25% (3) _____none (4)
condition of erosion site
____toe and upper edge eroding (3) _____ toe eroding (2) _____toe stable, upper edge eroding (1)
stability
____increasing (2) ____stable (0)
erosion severity*
____ very severe (4) ____severe (3)_____moderate (2)_____slight (1)

TOTAL SCORE (max score of 50): _____

***Erosion Scoring Form Instructions**

Soil texture
If the bank is stratified, please estimate the percentage of each soil type observed. Estimate soil type visually. However, if you can determine a more specific soil type by touching the soils, record this observation. You can use this more specific classification to determine a dry density (for calculation of annual loading. See below.)

Height of erosion site
Determine the height of the eroding bank from the water line to the top of the bank. If you cannot reach the bank to measure it, estimate the height by checking a category.

Length of erosion site
If you cannot reach the bank to measure the length of the site, estimate the length by checking a category.

Erosion Severity
Estimate the severity of erosion using the following descriptions. This estimation can be used to approximate the lateral recession rate.

Category	Description	Lateral Recission Rate (feet/year)
Slight	Some bare bank, but active erosion not readily apparent. Some rills but not vegetative overhang. No exposed tree roots.	0.01-0.05
Moderate	Bank is predominantly bare with some rills and some vegetative overhang.	0.06-0.2
Severe	Bank is bare with rills and severe vegetative overhang. Many exposed tree roots and some fallen trees and slumps or slips. Some changes in cultural features such as fence corners missing and realignment of roads or trails. Channel cross-section becomes more U-shaped as opposed to V-shaped.	0.3-0.5
Very Severe	Bank is bare with gullies and severe vegetative overhang. Many fallen trees, drains and culverts eroding out and changes in cultural features as above. Massive slips or washouts common. Channel cross-section is U-shaped and stream course or gully may be meandering.	0.5+

Calculating Sediment Loading

Sites can be scored relative to one another and targeted for improvement projects using the scoring system indicated in parentheses. A maximum score of 50 can be obtained. A higher score indicates greater erosion. Sediment loading from each site can also be estimated based upon the geometry of the site and an estimation of the lateral recission rate. The lateral recission rate is the thickness of soil eroded from a bank surface perpendicular to its face in an average year. It can be estimated by using the above table, by reviewing aerial photographs (in which a change in the bank location can be measured over time) or by observing the bank's position relative to a stationary object (such as a utility pole or culvert) over time. Use the following equations to calculate the volume and weight of sediment loss in an average year.

Volume of annual soil loss (cubic feet/year) = length of eroding bank (feet) * height of eroding bank (feet) * lateral recission rate (feet/year).

Weight of annual soil loss (tons/year) = volume of annual soil loss (cubic feet/year) * dry density (tons/cubic foot).

Use your estimation of soil type to determine dry density. If the soils are stratified or mixed, determine the average density by multiplying the percentages of each soil type by their respective densities and adding. For example, for an eroding bank composed of 40% clay and 60% silt, use the following equation:

0.4 * 0.035 + 0.6 * 0.0425 = 0.0395

Use the following dry density soil weights to determine the weight of annual soil loss. If you were able to determine a more specific soil textual class, use that determination to estimate a dry density from a source on soil physical properties. For example, sandy clay loam has a density of 0.045 tons/cubic foot.

Soil textural class	Dry density (tons/cubic foot)
sand	0.055
silt	0.0425
clay	0.035

Source

MDEQ Surface Water Quality Division. Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual. Revised June 1999.