Ohio Lake Erie Phosphorus Task Force Minutes
April 29, 2009
ODNR, Building H-2, Columbus, OH

Attendance: Gail Hesse, Julie Letterhos, Jeff Reutter, Paul Bertram, Seth Hothem, John Kessler, Kevin Elder, Rick Wilson, Dan Button, Mark Scarpitti, Pete Richards, Libby Dayton, Robert Mullen, Todd Hesterman, Dave Baker, Roger Knight, Larry Antosch, Rem Confessor, Julie Weatherington-Rice, Jack Kramer, Chris Riddle, Norm Fausey, Gerry Matisoff. Observers: Eric Partee, Joe Logan, Ron Wyss. Guests and Presenters: Erin Sherer, Dan Mecklenberg, Kirk Hines, Dan Dudley.

Chair Gail Hesse welcomed participants and reviewed the agenda. Following updates, there would be several presentations on stream assimilation and morphology. The afternoon discussion would focus on reviewing the agricultural section of the final report and agreeing on the recommendations. The final item of the day would be discussing timelines and overall needs for the final report and matrix recommendations.

Julie Letterhos provided an update on the efforts of the Lake Erie Lakewide Management Plan (LaMP). The LaMP has been working on a somewhat parallel effort to the P Task Force in developing a lakewide nutrient management strategy. The latest progress was related to proposed TP targets/indicators for the lake. In order to prevent further algal blooms in the lake and support fisheries productivity, the LaMP is proposing the following TP targets:

Eastern Basin	10 - 13.5 µg/l
Central Basin	10 – 13.5 µg/l
Western Basin	15 – 18 µg/l
Nearshore	15 – 20 µg/l
Coastal Wetlands	20 – 30 µg/l
Tributaries	25 – 30 µg/l

The targets were developed by the Indicators Task Group of the Lake Erie LaMP and are based solely on biological response. The focus is on concentrations vs. loadings because concentrations are what drives the presence of algal blooms.

P Task Force members questioned how these targets were derived and what the objectives of the LaMP were as related to TP management. They cautioned against setting targets that are unachievable.

Prior to the meeting, Seth Hothem had circulated notice of a bill introduced in the Senate by Senators Lautenberg and Voinovich to amend the Federal Water Pollution Control Act to modify provisions relating to beach monitoring. Included in the bill was a provision to monitor the impact of algae on coastal recreation waters that would also quantify the P concentrations associated with the algal problems. U.S. EPA would also be directed to determine if the IJC targets for P in the Great Lakes should be updated and to further propose water quality criteria for P in the Great Lakes.

Gail said she would be speaking about the P Task Force to the Institute of Journalists and Natural Resources class led by Peter Annin on May 2 at Stone Lab. Others from the P Task Force who would also be speaking to the class at various venues included Jeff Reutter, Kevin Elder and Roger Knight.

Several upcoming events are the Midwest Association of State Departments of Agriculture meeting on July 18 and the Great Lakes Phosphorus Forum in association with the Organization to Minimize P Losses from Agriculture (SERA 17) from July 28-31 in Windsor. Gail will be providing the keynote at the SERA 17 meeting. Another upcoming meeting where it was suggested the progress of the P Task Force be included in the agenda was the SWCD Summer Supervisor School in July.

Erin Sherer of the Division of Surface Water at Ohio EPA then gave a presentation on the assimilative capacity of riparian zones, floodplains and channels for phosphorus. Topics to be covered included: the physical capacity of riparian buffers, floodplains and channels; biological processes and cumulative benefits; ability of a system to process materials or substances at a certain concentration without itself being degraded; and how much a stream can assimilate and still meet water quality targets.

The assimilative process includes physical, biological and chemical components. The ability to assimilate is compromised when natural features are removed. The primary natural feature is a narrow low flow channel with connection to a floodplain and vegetated riparian areas.

30 meters (98ft) is generally accepted as target widths for buffers to achieve 85% TP removal. Both grassed and forested buffers are effective. Roots in buffer zone will remove DRP if contact occurs. Subsurface drainage systems will bypass the buffers. It is estimated there is 50-83% of DRP removal in a 100ft. buffer. Phosphorus does not have an escape clause like nitrogen (which can be denitrified and released to the air as nitrogen gas. It is always in the system unless it is harvested. Buffer areas can become saturated as soil binding sites are filled.

The advantages of Buffers include: enhanced soil microbial activity increases assimilation; stable banks prevent erosion; contribute woody debris to the system; provide water retention and infiltration areas; provide shade for the water environment; filter pollutants; and provide migratory corridors.

The advantages of floodplains include: slow storm runoff; decrease energy; buffer hydrologic change; provide lateral pathways for nutrient cycling; and provide refuge for aquatic life during high flows.

Channel modification affects how and where fine sediment is deposited. Natural channels are more sinuous. Pools, riffles and runs allow for varying velocity to reduce nutrient retention in the stream. Modified channels increase P retention time and result in excess algae and simplified trophic levels.

In the biological process, phosphorus binds to sediment or is taken up by the biomass. The biomass decays and moves the P back into the system. Cumulative effects begin in headwater streams which constitute 78% of the stream miles in Ohio. They retain and process coarse particulate organic matter (POC) and export fine POC which serves to support higher levels of biomass. Assimilative capacity is higher in natural streams. Several questions raised were: Does the net import of large woody debris cause sediment to settle or to erode? How much TP in tributary loads ends up in the floodplain?

Dan Mecklenberg of ODNR gave a presentation titled Stream Services and Channel Morphology. He has done a lot of research into channel design over the years. He has been working with the 401/404 authorities to make better streams.

Channel size influences the effect of a stream. More nitrogen is lost as the depth decreases. There is a need to focus on headwaters and floodplains to increase assimilation. Ditches and small flat streams serve as conduits while natural small flat streams provide treatment for improve water quality. There is a difference between flood storage, flood treatment and flood transport. There needs to be resistance on the floodplain for it to be effective. Robust vegetation is needed to slow down and treat flood waters.

Channel design is limited by form, not composition. He has been designing and promoting two-stage ditches by constructing overwide ditches to allow natural attenuation to take over and create a narrower natural ditch channel and a sink. Two stage ditches improve water quality, but we need many continuous miles of improved ditches, not just sporadic projects here and there, to make a difference in Lake Erie. We also need more monitoring of engineered ditches to measure improved WQ.

How would we harvest P from floodplains once it is saturated? How many miles of re-engineered ditches/floodplains do we need to make a measurable difference in the long run?

Kirk Hines, ODNR, then gave a presentation on the Rural Drainage Initiative. The purpose of the initiative is to recommend solutions for drainage infrastructure and address the environmental challenges.

There are both good and bad effects from ditching. The good impacts include: many conservation practices require good drainage; drainage reduces compaction and peak runoff; crop yields are increased; environmental services and nutrient assimilation are improved. The bad impacts include: leading cause of impaired WQ; nutrient loading may be significantly increased; habitat degradation often results from poor maintenance.

Rural drainage is often on glaciated lands in upland or headwater areas draining less than 3 sq. miles. These areas have often been historically channelized for many years. Two-thirds of Ohio cropland (>7 million acres) is currently drained. Much of this is in the

unglaciated Northwest/west part of the state. Ohio ranks in the top 5 states nationally for subsurface drainage and is #1 for the % of cropland drained. More than 500,000 rural home lots rely on group drainage projects. Drainage laws were first passed in Ohio in the 1840s. In 1957 all petition ditch projects were required to be put under public maintenance. About 30% of Ohio ditch projects today require a public consultation, meaning they have not been historically ditched. The main reason ditches are petitioned for maintenance is for blocked tiles, sediment bars and overgrown woody vegetation. The willingness to accept/consider alternative designs that would improve WQ is largely influenced by the increased costs that may be associated with alternative design.

Recommendations to improve the potential to more environmentally maintain ditches include: the use of Clean Water Act funds; need to change the existing culture to improve WQ in the long term; the benefit to Lake Erie needs to be calculated back in to the cost for implementation; need to add the economic benefit of environmental impacts.

The Rural Drainage Initiative Committee has prepared a draft manual to better guide the decisions related to maintenance and construction of rural drainage programs. The manual includes a list of steps to assess to determine what type of drainage will best suit the needs and environmental quality of an area.

See presentations posted on the web site for more detailed information.
Overall Questions and Comments: Has there been any attempt at prioritizing where improved ditching would provide the most benefit? Not yet. Funding to enhance cost share might be based on where the process would make the most difference.

We may want to review how the Greenway program was developed for Franklin County was developed by the Franklin Co. SWCD. It was largely done to protect the water supply for the city of Columbus, similar to what was done to protect the reservoirs supplying the drinking water for the New York City.

What the landowner is agreeable to is a bit decision factor into what gets done. How do we funnel a large scale societal benefit into the process so that responsible landowners will buy into the process? There may be some potential to tie into stimulus funding for incentives if the environmental benefit can be identified. However, we still need better management on the fields to better control what ends up in the ditches.

There is a move to push for a year-long cropping cycle as opposed to 6 months (i.e. add winter cover crops to increase assimilation capacity on fields).

Absentee landowners are a big issue because they are not aware of what is happening on the land or because they fear they would lose money. Need to change current approach/idea of trying to get water off the land ASAP. Need water management projects rather than trying to get rid of water ASAP. There needs to be more than just a

drainage issue/approach. Don't slow water off the land, but need to slow water runoff to the adjacent water body.

Discussion and Comments

1. Look at Franklin County Greenways process.
2. Need a target for loadings and what the potential for ditch management to reduce loadings.
3. How do you capture ecological goods and services?
4. What is the potential to support the recommendation on page 7 of the rural drainage fact sheet in the recommendations from the P Task Force.
5. Reduce annual discharge.
6. What is the potential to shut off tiles in the spring and what reduction would that cause.
7. Need to consider the impacts of combined use of a number of BMPs (cumulative effects)
8. Tap into powers at the local level
9. Need to couch recommendations under documentation of how much the practice or recommendation would or would not do to decrease loads.
10. Can we connect various practices to impacts (loads) to the lake or locally?
11. What's the increment in floodplain storage that we gain in drainage ditches?
12. Need a better handle on quantifying results: what are the application rates on the field, does it stay where it is put, how to keep it on the field, what do we do when it gets to the tiles/ditches
13. What is the appropriate package of plans to implement in a particular watershed
14. Has there been enough change related to ditches since 1995 that would justify us to recommend the approach to ditch management?

15. The "bundled practices" approach got incorporated into the EQIP program.

16. Do we need to do ditching practices for a long area along ditches or could we widen out the ditch in odd areas and create wetlands and leave the rest of the ditch alone.

17. A properly working subsurface drainage system should not be contributing excessive P. Areas with no subsurface drainage may actually be contributing more P.

18. Unless we have quantification numbers, we need to recommend a number of BMPs and not just focus on one. Need to look for intervention opportunities.

19. All we need to do is follow the bloom and notice that the outer edges turn the brightest green.

20. Drainage vs. application processes. (Settle the hash and mess it up the right way)

21. Overall, again we need to consider what has changed since the mid 1990s and determine if ditch drainage may influence this.

22. The more recent tile installations are deeper. Initial systems were fairly shallow. Deeper allows for more assimilation before water runs off.

23. Keep focused on the fact that is it DRP that is increasing and it behaves differently than TP. Methods originally adopted to reduce TP loadings won't necessarily work to decrease DRP.

24. The removal and application of fertilizer are getting closer to equilibrium than they have ever been.

25. Maumee and Sandusky loads are increasing and the loads are storm runoff related. Inputs are increasing. Need to determine how to manage things differently.

26. Large farms are getting larger. Equipment is getting larger. Large equipment is leveling soil more smoothly, getting rid of all roughness that might add some opportunity to slow runoff down.

<u>Discussion of Agricultural Overview prepared by Kevin Elder</u>

General comments

- A stale seed bed is a field that was plowed/cultivated in the fall and not planted until spring, with no additional preparation.

- Farms have gotten bigger, less diverse and more specialized. The big increase in no till farming began in NW Ohio in the early 1990s. The was also about the same time that precision ag grid application began in NW Ohio. 80% of the land in NW Ohio is tilled and 24% of that is in no till.

- It can take 30 to 35 years to crop down (lose traces of excessive phosphorus associated with the location of an old hog farm or chicken yard).

Members discussed the six bullet items in Kevin's write-up to determine if all agreed that these were the major agricultural points. Some bullets may require a statement that the "Task Force agrees w/statement but would like additional research to back it up. Also, add to each bullet what the potential consequences of the change/action were.

Bullet Number 1 was okay.

Bullet 2 should be split to address drainage and runoff separately.

For Bullet 3, add the impact of the changes in the size and types of equipment. Also move the phrase “Larger farms requiring spreading work load over year and increasing the tendency of application of fertilizers after crop harvest” up to bullet 3 from bullet 5. Larger farms changed application methods because they can’t take as much time to apply.

Move the first part of Bullet 5 (Changing methods, timing and placement of nutrients…) up to be bullet 4. Include the following: there is more surface application and less incorporation of fertilizer; broadcast vs. drycast; changes in fertilizer formulation; differences in application; banding (cutting fertilizer in next to seed); moldboard/conventional tillage vs chisel or discs. Newer methods are less effective in burying fertilizer than older methods. In some areas there is no incorporation at all. This applies to both commercial application and manure.

To number 3, add the impact of the changes in type and size of equipment (i.e. it has changed how fertilizer is added.) Move the reference to larger farms in bullet 5 up to be included in bullet 3.

Move bullet five up to follow bullet 3. In reference to changing methods, bullet 5 should include: lack of incorporation, change in fertilizer formulation, differenced in application (broadcast vs. drycast, banding - cutting in fertilizer next to seed, difference between conventional tillage with old moldboard and chisel or discs, there is less effective burying now for both commercial fertilizer and manure applications.)

Former bullet 4 now becomes bullet 5. Mention increased tilled infiltration rates. The potential for increasing organic matter by 1% in NW Ohio is huge. Chemistry dominates P solubility in soil, not biology.

The last sentence in the original bullet 5 – Unknown and uncertain use of soil testing and the following of nutrient recommendations becomes bullet 6.

The original bullet 6 should be moved down into the text and dropped as a bullet. The revised text should read: “The ability of soils to adsorb phosphorus and the soil nutrient interactions for many of the over 400 soil types in Ohio, especially the soils of the western Lake Erie basin, are not well known and will require additional research.

If the trends on page 16 are what we agree to, what should be incorporated into the recommendations matrix? The purpose of the report is to explain to the Directors of Ohio EPA, ODNR, ODA and NRCS what is going on and why, and make recommendations as to what we should do about it. If we don’t do something, at what point will someone or the aquatic community be poisoned by toxins from algal blooms or impacted by loss of income due to impacts on the recreation industry?

Phosphorus fertilizer sales are way down due to costs. However, there has been less incidence of storms this year so far so we wouldn’t necessarily see a reduction in impact.

The major recommendations should be: soil tests; follow recommendations based on soil test results; incorporate fertilizer and manure; only put on what you need; work more with fertilizer dealers than producers.

What has been done to date? Lake Erie Protection Fund, GLPF and GLNPO grants are addressing improved soil tests; tracking DRP and algal blooms; NRCS is revising P index; EQIP is embracing funding for bundled practices (see Wooster fact sheet); the results of the grant funded projects may lead to big national research grants.

There has been an increase in the number of absentee land owners. What is the overall impact of this?

Need a good definition of incorporation and be careful not to suggest that this means a return to moldboard plowing. Mark S. has definition of incorporation that he uses in NRCS fact sheets.

Need to capture points of intervention in the Recommendations Matrix.

The CRP/CREP manual was originally for water quality improvement through sediment control. It recommended that the vegetation in buffers be harvested every several years. But now, it is recommended that the buffers be left undisturbed for habitat. We may want to target some programs in the Lake Erie basin to allow harvest of the buffer strip vegetation to remove the build-up of nutrients.

Kevin will revise agricultural trends overview. Mark will write-up CRP comments for matrix.