Upper Mississippi River Basin Association
Water Quality Task Force
October 8-9, 2008
Dubuque, Iowa

Meeting Summary

Participants

Matt Short	Illinois EPA
Roy Smogor	Illinois EPA
John Olson	Iowa DNR
Adam Schnieders	Iowa DNR
Marvin Hora	Minnesota PCA
Mohsen Dkhili	Missouri DNR
Jim Baumann	Wisconsin DNR
John Sullivan	Wisconsin DNR
Bill Franz	US EPA, Region 5
Dave Bolgrien	US EPA, ORD - Duluth
Mark Pearson	US EPA, ORD – Duluth
Shannan Garretson	Iowa Environmental Council
Dave Hokanson	UMRBA
Barb Naramore	UMRBA

Call to Order and Introductions

The Water Quality Task Force (WQTF) meeting was called to order at 12:35 p.m. by Jim Baumann, WQTF Chair. Introductions of all in attendance followed. Shannan Garretson commented on her role representing the McKnight Foundation's Mississippi River Water Quality Collaborative and gave a brief description of the Collaborative.

June 2008 Meeting Summary

Baumann asked if there were any comments or corrections on the notes from the June 2008 WQTF meeting. Mohsen Dkhili indicated that, on page 3 of the notes, the number of colony forming units (cfu) for the level "B" criterion should be 548 (rather than 546). He further noted that the level "B" classification was subsequently disapproved, so that in actuality the level "A" criteria (of 126 cfu) is applicable for all whole body contact use designations.

UMRBA Update

Outcomes of Clean Water Act-Ecosystem Restoration Workshops
Dave Hokanson reported on the outcomes of the April and June 2008 workshops, which brought together staff from Clean Water Act (CWA) and Ecosystem Restoration programs on the Upper Mississippi River (UMR), with the intent of exploring potential policy and practice interfaces between these two programs areas. He commented that the workshops were successful and that a final report had just been completed and distributed by the UMRBA.

Hokanson circulated a summary table displaying potential next steps in cross-program coordination that were identified at the workshops. Among these, he noted that the following may be of most interest to the WQTF, or may directly involve the WQTF:

- Continue efforts to discuss, harmonize, and refine state CWA water quality standards applicable to the UMR (including designated uses and criteria), with input from ecosystem restoration staff.
- Develop biological indicators for the UMR that serve both CWA and ecosystem restoration programs. (Hokanson mentioned that an interagency work group had already been formed to address this issue, and that its efforts would be described in more detail later in the day.)
- Examine quality assurance and analytical methods requirements for CWA and restoration program sampling, analysis, and data management to identify opportunities for enhanced data sharing.
- Coordinate monitoring schedules across programs/agencies/states to maximize efficiency and minimize redundancies.
- Summarize and share US EPA Environmental Monitoring and Assessment Program (EMAP) data across programs.

Hokanson suggested that the WQTF consider this list of potential next steps, and then discuss them the following day to determine which possibilities the WQTF views as most promising.

Upcoming UMRBA Water Quality Executive Committee/Board Discussions
Hokanson noted that the Water Quality Executive Committee (WQEC) will be meeting jointly with the UMRBA Board in November at the Association's quarterly meeting in Davenport. He added that this meeting will provide an opportunity for the Board and WQEC to discuss strategies to enhance the UMR's water quality profile and secure resources to support coordinated, interstate water quality work on the river.

Letter to US EPA Regarding Hypoxia Operating Plan/Federal CWA Strategy for Basin
Hokanson reported that the UMRBA had sent a letter on September 8, 2008 to US EPA's Office of Water Assistant Administrator Benjamin Grumbles. The letter comments on the FY 08 Hypoxia Operating Plan, which indicates that US EPA will examine opportunities for "a federal strategy to improve the effectiveness of Clean Water Act programs in the Mississippi Basin." He added that this correspondence had been first suggested at the June WQTF/WQEC meetings and had been drafted with input from the WQEC to the UMRBA Board. Hokanson noted that the following themes were emphasized in the correspondence:

- The importance of state-led local water quality improvements to overall success.
- The need to support and build upon existing interstate efforts, such as those taking place through the UMRBA.
- The historic, cooperative relationship between the states and US EPA in implementing the CWA.
- The ongoing work of the sub-basin teams, such as UMRSHNC, in addressing the hypoxia issue.

Hokanson also distributed a summary of items from the FY 08 hypoxia "operating plan" that may be of greatest interest to the WQTF. Barb Naramore commented that Holly Stoerker will be serving as a reviewer for the current NRC project addressing the CWA on the Mississippi River, and that this project is a primary mechanism through which the US EPA is examining potential "federal strategies" for enhancing the CWA's effectiveness on the Mississippi River, as called for in the Hypoxia Operating Plan.

Interagency Personnel Agreement with US EPA
Hokanson reported that UMRBA staff continue to work with US EPA Office of Water staff on implementing an interagency personnel agreement (IPA) under which the US EPA would provide staff support to the UMRBA for the designated use project and other WQTF work. He noted that the first attempt, which would have required US EPA staff to relocate to UMRBA did not attract qualified

candidates. Hokanson explained that the position had been re-advertised to allow the individual to stay in their current work location and that applications had been received and would be examined soon.

State Updates

Lake Pepin Update
Marvin Hora reported that work on the Lake Pepin TMDL was moving forward and that the following eutrophication goals were being considered as targets for work on the TMDL: 32 ug/l chlorophyll-a, 0.8 m Secchi depth, and 100 ug/l phosphorus. Hora added that Limnotech had completed modeling on Pools 1-4 and that initial goals for reduction being determined, with the indication that 20-50% load reductions would be needed for TMDL targets to be met.

John Sullivan commented on the recent Lake Pepin Technical Conference, noting that it was both well attended and well run. He highlighted that one of the new pieces of information presented at the conference was that the contribution of streambank erosion to overall sediment loading was greater than previously estimated, and therefore that off-field erosion was not as large a contributor as previously thought.

Sullivan indicated that Wisconsin's perspective is that Minnesota's approach to addressing its turbidity impairment must also address Wisconsin's reason for listing – excessive sediment impacts on submersed aquatic vegetation (SAV). He added that a TMDL goal/target for SAV is being considered as a means of addressing this issue.

Baumann reported that Norman Senjem's presentation at the June 2008 Clean Water Act-Ecosystem Restoration workshop had led to considerable discussion between Wisconsin DNR and Minnesota PCA staff regarding the selection and use of biological endpoints.

Baumann also commented that less than 10% of Wisconsin is in the Lake Pepin watershed, as compared to about 50% of Minnesota. He also noted that the preponderance of the watershed's population and pollution sources are within Minnesota. Baumann observed that the geographic scale and time frame associated with implementation of the Lake Pepin TMDL targets are quite considerable, with the timeline likely longer than most would realize (10 to 20 years or more).

Hokanson asked how the TMDL's eutrophication goals, as mentioned by Hora, were to be understood – as criteria, as loads, or something else – in a regulatory sense. Baumann replied that both the biological goals and physical/chemical criteria could be used as measures of success, with a critical question being that of independent applicability—i.e., it still needs to be determined whether meeting one set of measures is sufficient or whether all must be met.

Sullivan offered that the relationship between biological and chemical/physical targets needs to be well understood, and targets set for the two kinds of metrics must be consistent. He added that there is a work group addressing this exact question--i.e., relating turbidity criteria to the desired vegetative response. Hora commented that legal advice within MPCA is that independent applicability applies here; thus both targets must be met. Baumann suggested that site-specific criteria for Lake Pepin may provide a mechanism to address the challenge of independent applicability.

Mohsen Dkhili suggested that situations may arise where the criterion for a specific parameter to support aquatic life may differ from the criterion for the same parameter that supports aquatic recreation. Hora replied that, in cases such as this, the most restrictive criterion becomes the goal. Dkhili acknowledged this point, but provided an example where meeting the clarity goal for recreational use appeared to result in a decline of fish populations for sport fishing. Sullivan commented that this situation could potentially occur for oligotrophic lakes, but was unlikely for eutrophic lakes. He also added that fishing success may not be the primary intent of an aquatic life use designation.

Hokanson asked the group how the information and lessons learned from the Lake Pepin effort should be brought into the WQTF's discussions. Baumann suggested that more detailed discussion take place at the next meeting of the WQTF, noting that a draft TMDL may be available by that time. Sullivan concurred, adding that those working on the Lake Pepin TMDL would welcome the opportunity. Both Sullivan and Baumann indicated that the vegetation work associated with the Lake Pepin TMDL would have applicability outside of the TMDL and therefore would be relevant for the discussions of the WQTF. Hora suggested that Senjem could provide an update at the next meeting of the WQTF. Matt Short asked whether a draft TMDL would be available before the next meeting of the WQTF in January 2009. Sullivan and Baumann indicated that this was likely, though Hora expressed more reservation about a draft TMDL being complete. Sullivan added that even if a draft was not complete by that time, enough work had been done to provide for a meaningful update and discussion.

Minnesota

Hora indicated that MPCA continues to work on issues related to pharmaceuticals, including endocrine disruptors and personal care products. He commented that this continues to be a major issue in Minnesota and distributed a report from USGS regarding the occurrence of endocrine active compounds in the Mississippi River within the state of Minnesota.

Hora reported that MPCA is pursuing a proposal to the Legislative-Citizen Commission on Minnesota Resources (LCCMR) to establish a nitrogen budget for the Mississippi River. He also explained that MPCA will, in 2010, begin assessing additional surface waters for the drinking water use (using the drinking water maximum contaminant level of 10 mg/l for nitrate). This assessment will be done for all surface waters in karst areas of the state, where there is a potential interface between ground water and surface water. Hora noted that Minnesota will likely include a criterion for nitrate related to the aquatic life use as part of its triennial standards review in 2011.

Hora also reported that the Minnesota Department of Agriculture had recently done pesticide analysis on 50 randomly selected lakes statewide and found broad distribution of atrazine in these samples, including remote areas such as the Boundary Waters Canoe Area.

Baumann asked how MPCA is approaching nitrate levels for the protection of the aquatic life use. Hora replied that a considerable amount of toxicology data is available for nitrate and therefore a defensible chronic toxicity value could likely be determined. But he acknowledged that potential economic impacts would likely be an issue. He also emphasized that MPCA is working closely with the Minnesota Department of Agriculture on the issue.

Returning to the issue of pharmaceuticals, Hora noted the federal Drug Enforcement Agency stipulates that certain controlled substances should be flushed down the toilet, rather than thrown away. He indicated that MPCA would generally prefer that these materials be landfilled, but that the controlled substances regulations are a complicating factor. Franz added that a common practice in hospice care is to flush any unused medications. Hora indicated that facilities are to seek approval from waste water treatment operators before flushing, but operators are reluctant to give such approval. Sullivan commented that Wisconsin DNR and LaCrosse County have been working with local hospitals on this issue.

Wisconsin

Sullivan noted that he is completing work related to nutrient impairments of backwaters on the UMR. Baumann reported on work that Wisconsin DNR is doing for the lower Fox River and Green Bay, where a biological endpoint for aquatic vegetation is being considered, similar to the approach being taken for Lake Pepin. He also mentioned TMDL work on the Rock River, where the challenge is to develop realistic targets for phosphorous loading/reduction.

Baumann noted that Wisconsin continues work on phosphorous criteria more generally. He commented that compliance costs for future phosphorous criteria have been estimated to be in the billions of dollars. Baumann added that a site-specific phosphorous criterion for Lake Pepin was likely to be included in the next draft of Wisconsin's administrative rules, and that other types of site-specific criteria may be included as well. He reported that, to date, Wisconsin DNR only has the approval to work on the turbidity piece of the Lake Pepin TMDL.

Hora commented that Minnesota is considering dropping its turbidity criterion and instead using total suspended solids (TSS) or another parameter. He added that the motivation for this potential change is the discrepancies observed in turbidity results between different turbidity meters.

Iowa

John Olson began Iowa's report with a question to Hora regarding the eutrophication goals mentioned in the Lake Pepin discussion, asking whether these were specific for Lake Pepin or more broadly applicable. Hora replied that these were Lake Pepin-specific. Olson commented that they appeared to be similar to other numbers used by MPCA in southern Minnesota. Hora replied that the Lake Pepin numbers were similar, but somewhat higher. Olson also confirmed with Sullivan that the contribution from streambank erosion to in the Lake Pepin area was now considered to be approximately 2/3 of the total sediment load. Sullivan responded that this was correct in terms of what was presented at the Lake Pepin technical conference.

Olson next distributed a handout which provided a written summary of Iowa's report to the WQTF. From the handout, he highlighted the following:

- *Fish Tissue Monitoring*: Results of U.S. EPA's Regional Ambient Fish Tissue (RAFT) 2007 monitoring, which occurred at 3 sites on the UMR in Iowa (Guttenberg, Montrose, and Keokuk) are presented. A fish consumption advisory is now in place for Pool 12 between Bellvue and Dubuque, due to the levels of mercury detected in predator fish (largemouth bass). 2008 RAFT monitoring will take place in Iowa at Lansing, Dubuque, and Davenport.

- *Nutrient Criteria*: Olson also discussed Iowa's work on nutrient criteria development for lakes, rivers, and streams, reporting on previous recommendations of U.S. EPA Region 7's regional technical assistance group (RTAG) and Iowa's Nutrient Science Advisors committee. Olson noted that recommendations from both of these groups were primarily science-based and did not directly take into account background levels or attainability. A table of values proposed by these groups was included in Olson's handout. He also commented that U.S. EPA Regions 7 and 8 had convened a workgroup to identify benchmark nutrient values for the Missouri River.

- *Cyanobacteria*: A recent cyanobacteria bloom in the Lower Raccoon River, the source of drinking water for the City of Des Moines, gained attention in the media and raised questions about the notification process in place for such events.

Baumann asked Olson what percentage of Iowa streams would meet the benchmarks proposed by the RTAG. Olson replied that some streams in south central Iowa would not encounter problems meeting the benchmarks, but statewide he would estimate that 90% of streams would not meet the benchmark.

Baumann indicated that Wisconsin will be requiring waste water treatment plants to submit discharge data related to nutrients, but that this will only be one sample per permit renewal cycle (every five years). Thus, there will not be direct, ongoing monitoring.

Adam Schnieders reported that Iowa had submitted approximately 500 use attainability analyses (UAAs) to Region 7 for approval and is looking for response within the next 60 days. He also noted that Iowa has initiated rulemaking for antidegradation and is considering ways to address emerging contaminants from an antidegradation perspective. Schnieders indicated that there are a number streams which would be upgraded in their protection tier, and that this could benefit the UMR if these were UMR tributaries. He added that Iowa would also be replacing its total dissolved solids criteria with criteria for chloride and sulfate, with a chloride criterion proposal expected by the end of the year and the sulfate criterion matching Illinois'.

Schnieders also reported that there would be legislatively mandated future rule making efforts for widespread economic/social impact variances for many wastewater treatment plants in Iowa having to comply with more stringent permit limitations, especially for ammonia-nitrogen and E. coli.

Dkhili asked whether Iowa is requiring disinfection for all wastewater dischargers. Schnieders replied that all continuously discharging municipal facilities will be required to disinfect, depending on their specific discharge situation.

Schnieders also noted that, although Iowa's standard for arsenic has been exceeded on the UMR, US EPA Region 7 has indicated that Iowa should not pursue a TMDL and has instead advised Iowa to revisit its arsenic criterion. However, he added, that the instructions from Region 7 have not been entirely consistent on this matter and that Iowa is waiting to hear back from Region 7 with a more definitive answer.

Baumann asked whether the 500 UAAs completed by Iowa were considered downgrades in use. Schnieders replied that these were not downgrades, but rather an attempt to better identify the appropriate use for these waterbodies. Baumann then commented that, in his experience, most UAAs were employed in this way—i.e, to better match the use designation to the waterbody. He added, however, that US EPA seems to generally view UAAs as downgrades. Schnieders concurred, adding that it is important to carefully describe the use and application of the UAA.

Illinois

Short provided a brief update on the status of Illinois' ambient monitoring program, noting that following the statewide shutdown of monitoring in October 2007, a total of 86 monitoring stations had been re-started, including the 11 stations on the UMR. Short indicated that the five year basin rotation for monitoring continues in Illinois.

Short reported that Illinois had experienced five major flood events in the past year, including a fall flood on the lower portion of the UMR within the state. He added that this September 2008 flooding event led to many new high water marks.

Short noted that Illinois completed a special study examining the presence of pharmaceuticals in water supplies used for public drinking water. He explained that the study looked at raw and treated water from five public water systems, including two on the UMR. Short reported that the study found 16 different products present, but none were above "levels of concern" as determined by comparison to thresholds developed in California and Australia. These thresholds were referenced because Illinois does not have applicable standards for these products.

Short commented that Illinois does have a new provisional criterion for sulfate and is planning to drop its total dissolved solids criterion.

Short next explained Illinois' proposed new dissolved oxygen (DO) criteria for streams. He explained that, under this approach, different DO criteria apply for "Level 1" and "Level 2" streams, with Level 1

streams having higher required concentrations of DO. Short indicated that approximately 8 % of interior streams statewide were classified as Level 1, with the classification being based on factors including fish, mussel and invertebrate populations. Also, he explained, the DO criterion is adjusted seasonally; so that the one day DO minimums for each stream type are as follows:

- Level 1 Streams: March-July = 5 mg/l, August-February = 4 mg/l
- Level 2 Streams: March-July = 5 mg/l, August-February = 3.5 mg/l

Short added that four distinct segments of the UMR have been classified as Level 1, and displayed these areas on a map. Sullivan asked whether these DO criteria are applied throughout the floodplain of the UMR, or just to the mainstem of the UMR. Short responded that the numeric criteria apply to the mainstem and that a narrative criterion is applicable to backwaters.

Short indicated that Illinois' work on nutrient criteria continues, with the most recent meeting on this effort being held in February 2008. Data have been submitted to TetraTech, with the results of the contractor's analyses still pending.

Short also reported on Illinois efforts to reexamine expectations for northeastern Illinois waters through a UAA process and subsequent ongoing rulemaking proposal. Smogor explained that the intent of the effort is to "raise the bar" for aquatic life use expectations, while adding that currently only secondary contact use is designated for these waters and that disinfection is not being required for continuous dischargers, including the Chicago wastewater treatment plant. Dkhili asked whether any UAAs were being done for the UMR. Smogor replied that Illinois is not doing any UAAs for the UMR.

Missouri
Dkhili indicated that UMR listings for lead and zinc would be included in Missouri's 2006 303(d) list for the segment between Lock& Dam 27 and the Ohio River. He added the segment of the Mississippi River between the Ohio River and the Arkansas state line would be listed for mercury.

Dkhili also reported that there has been no final decision on a proposal to exclude a 28.3 mile stretch of the UMR in the greater St. Louis area from the primary contact recreation use designation that Missouri is applying on the remainder of the UMR within its borders.

US EPA Update

2009-2014 Strategic Plan Update
Bill Franz reported that language regarding the UMR is currently included in the draft of US EPA's 2009-2014 Strategic Plan.

US EPA's Council of Large Aquatic Ecosystems
Franz indicated that a meeting of US EPA's Council of Large Aquatic Ecosystems will be taking place on October 28th. Tim Henry of Region 5 will attend as an "at large" member, as the Mississippi River is not currently part of the Council. Franz further indicated that the Council will be interfacing with US EPA's Strategic Planning Team in the development of revisions to the Strategic Plan.

Franz commented that, generally, Region 5's perspective on the UMR is to support the ongoing work of the states and the UMRBA. He observed that Region 7's perspective may be more focused on agricultural programs.

Hypoxia Action Plan
Franz reported that the 2008 Gulf Hypoxia Action Plan was completed and signed in June 2008. He noted that the Action Plan was accompanied by an FY 08 Operating Plan. Franz explained that the

actions in the Action Plan were more general, while the Operating Plan was developed to provide a summary of more discrete, year-by-year tasks that support the Action Plan.

Hora asked whether a coordinated budget has been developed to support implementation of the Action Plan. Franz replied that no such budget has been created.

Upcoming Wastewater Operators' Workshop
Franz noted that US EPA is working with ORSANCO to put on a workshop for wastewater treatment plant operators regarding nutrient control, energy use, finance, and other issues. The workshop is scheduled to take place November 18-19, 2008 in the Cincinnati area. Schnieders asked whether the workshop was open to just "major" class plants. Franz replied that it was open to both "majors" and medium-size plants and that, while the workshop is focused on attendees from the Ohio River area, individuals from other areas of the country are welcome to attend. He added that further information would be made available to the WQTF regarding the workshop.

UMR Early Warning Monitoring Network
Franz briefly described the types of instrumentation incorporated into the monitoring stations being established by US EPA on the UMR under a Regional Applied Research Effort (RARE) grant. He explained that this instrumentation includes a multiprobe sonde to measure conventional water quality parameters (such as pH, dissolved oxygen, and temperature), a UV fluorescence sensor to detect petroleum products, and equipment to measure the gape behavior of mussels as they respond to water quality changes. All of the data are collected and reported continuously. Franz added that an auto-sampler is also included that will collect a grab sample if triggering criteria are met, and that this grab sample is used to help identify specific contaminants.

Franz reported that three monitoring stations are currently in place on the UMR within the state of Minnesota. Two additional stations, at Lock & Dam 14 and at the University of Iowa research center near Muscatine, are under development. A site at Lock & Dam 26 is also being considered.

Sullivan asked if the data from the monitoring stations are being archived. Franz indicated that the data are being archived, and the group involved in the project is now considering procedures for sharing the monitoring data. Garretson suggested that notification to the National Response Center be included. Hokanson and Franz responded that this could be a future piece of the notification system, but may not be appropriate for the current research phase.

UMRCC Water Quality Tech Section Update

Short reported on the Upper Mississippi River Conservation Committee Water Quality Technical Section meeting that was held at the University of Iowa research center near Muscatine, Iowa on October 1-2, 2008. He highlighted presentations by the following individuals: Dave Bierl, USACE (transparency tube monitoring); John Sullivan, WI DNR (nutrient impacts on backwaters, filamentous algae); and Scott Yess, USFWS (UMRCC update including Fisheries and Connectivity plans).

UMR PFC Sampling

Hokanson reported that results from spring/summer 2008 PFC sampling are not yet available and have been slowed down by issues with another study carried out at the same EPA lab that is analyzing the UMR samples. He explained that, although this analytical issue was not a concern for the UMR water samples, it had triggered additional internal review requirements within US EPA that would slow down release of results generally. Hokanson reported that the EPA researchers had indicated that 2008 results appear to be in a range similar to the 2007 results, and that more detailed information will be available when a draft manuscript on the UMR sampling is prepared, though they could not yet provide a timeline for the availability of this manuscript.

SPARROW Model

Franz noted that Dale Robertson of USGS has been revising the SPARROW model. The model's ranking of 8 digit HUC code areas for nitrogen and phosphorous loading should be available soon. Franz commented that the Chicago area will rank highest of all the 8 digit HUC areas. Baumann asked whether issues regarding phosphorous contributions raised in an earlier version of the SPARROW model had been addressed in this revision. Franz replied that this issue has been addressed. Baumann also asked how the results would be released. Franz replied that they would be released via a journal article, but that pre-release information may potentially be available.

Environmental Monitoring and Assessment Program-Great Rivers Ecosystems (EMAP-GRE) Update

Great River Fish Index
Mark Pearson provided a presentation on the Great River Fish Index (GRFIn), an index of biotic integrity recently developed by EMAP-GRE for the UMR. Items noted by Pearson in his presentation included the following:

- In terms of physical stressors (sedimentation, flow, and land use), on the impounded UMR there is a slight increasing longitudinal gradient from downstream to upstream, with urban areas demonstrating greater stress than non-urban areas. On the unimpounded UMR, there is a greater variability in the stressors.
- The index of biotic integrity (IBI) process followed in developing the GRFIn was that laid out by Karen Blocksom (US EPA).
- Metrics retained for the Impounded Mississippi River GRFIn are:
    - Proportion of invertivore individuals (trophic)
    - Proportion of non-indigenous individuals (composition)
    - Proportion of individuals with DELTS (fish health)
    - Proportion of detritivore individuals (trophic)
    - Proportion of native individuals (composition)
    - Total deep-bodied sucker biomass (kg) (biomass)
    - Total number of fish species (exclusive) (richness)
    - Number of darter species (richness)
    - Catch per unit effort of native species (relative abundance)
    - Number of minnow species (richness)
- There appears to be a relationship between stressor and GRFIn scores for the impounded river.
- There are possibilities for applying GRFIn scores in both 303(d) impairment listing and ecosystem restoration contexts.
- Metrics retained for the Open Mississippi River GRFIn are:
    - Proportion of top piscivore individuals (composition)
    - Proportion of individuals with DELTS (fish health)
    - Total number of fish species (inclusive) (richness)
    - Number of minnow species (richness)
    - Number of great river species (richness)
    - Number of centrarchid species (richness)
    - Catch per unit effort top piscivores (relative abundance)
    - Total native fish biomass (kg) (biomass)
- "Great River" fish species were only retained for the Open Mississippi River GRFIn, as these species are less common in the impounded area of the river.

- Only three metrics were retained in common between the Impounded and Open River GRFIn indices.
- An IBI may not be an appropriate approach for the Open Mississippi River, though some utility may be gained in looking at the lower Missouri River, which has similar characteristics to the Open Mississippi River. An index could be developed/improved by looking at these data sets in combination.
- Data can be grouped and interpolated to give estimates of GRFIn scores for minimum interstate assessment reaches.

Sullivan commented that, in regard to the Open River, its character is largely determined by the Missouri River – so that data from the lower Missouri River could potentially be incorporated into the development of indices for the Open Mississippi River.

Smogor asked whether, ultimately, the biological data would stand alone in use of the index, without the stressor gradient information. Pearson replied that this was correct, but there was also value in tracking the physical/chemical data. Bolgrien added that having both the biological data and physical/chemical data helps to establish linkages between observed biological response and possible causes.

Pearson commented that, in developing the GRFIn, efforts were made to look at human-induced stressors rather than features that vary naturally along the length of the river. He added that caution was taken not to allow "circular linkages" between biology and stressor gradient components.

Bolgrien commented that the data associated with the GRFIn do not appear to show any significant year-to-year variation.

Other EMAP Data and Discussion
Bolgrien indicated that EMAP may provide a web-based version of its assessment for the UMR, which will separate data out by state and by impounded vs. unimpounded river. The assessment may also break the data out by the 13 minimum interstate assessment reaches.

Short asked about the status of a macroinvertebrate IBI being developed by EMAP. Bolgrien replied that this was in development and may rely on a different stressor gradient than the fish IBI.

Sullivan commented that the Minnesota and Wisconsin field stations have been examining the impact of sampling method on the outcomes of fish IBIs, finding that sampling method can greatly affect outcomes.

Bolgrien emphasized that the development and selection of indicators is not science-limited, and that moving forward should not wait upon the creation of a "perfect method." Sullivan agreed, but added that there must be agreement on the methods used.

Baumann observed that the Water Quality Task Force has discussed the idea of putting together a session on biological indicators, in the hope that an approach can be identified for use on the UMR. He cautioned, however, that there appear to multiple potential approaches and that there is a lot of individual ownership associated with different approaches.

Pearson suggested that various IBIs could be compared against each other to assess their applicability for the UMR. Bolgrien concurred, but added that IBIs can only be directly compared if using the same data and that; moreover, one of the key elements of selecting an IBI would be to determine if data existed to "feed" into a particular IBI. Olson pointed out that the other key consideration, in a Clean Water Act sense, is where an impairment threshold is drawn in relationship an IBI score. Bolgrien

concurred with this observation. Sullivan asked who would determine the threshold – the WQTF, the EPA, or someone else? Olson agreed this was an important question but added that he did not know the answer.

Biological Indicators for the UMR

Setting Biological Goals in a Clean Water Act Context
Roy Smogor of Illinois EPA provided a presentation on considerations for biological indicators in a Clean Water Act context. Items noted by Smogor in his presentation included the following:

- "Fishable and swimmable" shorthand for the Clean Water Act interim goal is not helpful in considering aquatic life use, and it is better to refer to the text of the interim goal, which calls for "wherever attainable…a balanced population of fish, shellfish, and wildlife...[to] be achieved…."
- Aquatic life use definitions, designations, and determination of attainment all need to be considered simultaneously, not as separate steps.
- Each defined aquatic life use is essentially its own goal.
- Defining the biological condition gradient (BCG) is critical, where the ultimate "biological integrity" goal of the Clean Water Act is highly natural condition and the "interim goal" is more in the mid-range of the gradient.
- Aquatic life use goals are defined by what is attainable along the BCG. If the attainable use is below the interim goal, a use attainability analysis (UAA) is then required, though a UAA may be useful in other situations as well.
- Articles by Stoddard and Davies may be helpful in working with the BCG.
- To be useful, a biological indictor must be :
    - clearly interpretable in terms of Clean Water Act aquatic life goals, and
    - sufficiently sensitive to human impact (signal) amid other sources of variability (noise)
- The ability of the indicator to detect the signal may vary at different spatial and temporal scales. These may be very prominent issues on a large river.
- There may be opportunities for biological indicators to serve both Clean Water Act and ecosystem restoration goals if the restoration goals also incorporate concepts of biological integrity and biological condition.

Olson asked whether pre-settlement conditions were potentially a goal to be considered for the UMR. Smogor replied that setting the desired reference condition is a key step, but that pre-settlement may not be a reasonably attainable condition for the UMR and that something such as "least disturbed" may be a more likely reference condition.

Baumann observed that "least impacted" could actually exist almost anywhere on the BCG continuum, depending on the state of degradation of the system. Smogor replied that the Stoddard paper is helpful in getting agreement on what is meant by terms and where they occur. In response to a question from Hora, Smogor also referred to the paper by Davies and Jackson as being helpful in determining where to anchor goals in the BCG. He also restated that the usefulness of indicators to ecosystem restoration efforts is dependent upon the goals established for restoration.

The meeting adjourned for the day at 5:15 p.m., resuming the following morning (10/9) at 8:00 a.m.

Biological Indicators for the UMR – Continued Discussion

Hokanson provided an update on the efforts of the interagency work group addressing the issue of biological indicators on the UMR. He explained that this group had been formed as an outgrowth of the discussions at the CWA-Ecosystem Restoration workshops held earlier in the year, and that it is composed of individuals from multiple agencies and includes those involved in both Clean Water Act and ecosystem restoration programs. Hokanson emphasized that the intent of the work group is not to preclude work being done in the WQTF and other forums, but rather to focus on the cross-program elements of indicator development and use.

Hokanson noted that one of the primary tasks of the work group is to aid in designing a biological indicators workshop for the UMR, to be held some time in early 2009. He distributed a draft agenda for the workshop and asked the WQTF members for their feedback on the work group generally and the workshop specifically.

Hora requested that Howard Markus of MPCA be included in the interagency work group.

Baumann noted that, while the WQTF has been most interested in the use of a fish IBI for the main channel, the broader cross-program discussion is also important. He added that the workshop will include an IBI component and it will be important for the audience to include those individuals working with IBIs who may be able to help implement ideas. Hora emphasized that it is important to determine the purpose of the workshop, and then build participation around that purpose.

Sullivan emphasized the importance of having participation and buy-in at multiple levels within agencies, including field, technical, and managerial staff. He added that, ultimately, program administrators' buy-in would be needed, even if they did not participate in an initial workshop. Hora concurred with the need for high-level agency support. Franz suggested that the November UMRBA Board and WQEC meetings would be an opportunity to encourage higher-level agency support.

Hokanson described the intent of the workshop as follows:

- To bring participants to a common level of understanding regarding biological indicators.
- To build an understanding of existing approaches to biological indicators.
- To identify the goals of the two programs areas (i.e., Clean Water Act and ecosystem restoration) regarding biological indicators.
- To explore the applicability of biological indicators in each program area.

Baumann asked the group for its sense of whether the WQTF is in a research mode or implementation mode regarding indicators. Baumann stressed that, if things are at an implementation stage, it is critical to engage agency management. Smogor replied that it does not appear that initial questions of what is being measured and why have yet been answered. Smogor said these questions must be answered before moving to an implementation step. Franz concurred, indicating that the workshop is intended to help address some of these questions.

Olson observed that one of the most challenging pieces is to establish a threshold for impairment against which to compare indicator data in assessing the condition of the water body.

Sullivan noted that one concern in the ecosystem restoration community may be that outputs of indices such as the GRFIn may not match up with the locations where restoration projects and funds have been focused. Naramore responded the approach in restoration on the UMR all along has been to not necessarily put all of the efforts into the most degraded habitats. Short added that restoration projects may often also have a specific focus, such as a specific fishery.

Short also raised the question of how an IBI should be applied in a waterbody that is artificially stocked with fish. Sullivan observed that, in regard to Lyons' work comparing the Wisconsin River and the UMR, the appropriate reference condition might be different for the two rivers.

Baumann summarized the discussion on biological indicators to this point by noting that:

- There are specific considerations for the application of biological indicators in a CWA context, particularly in regard to assessment and listing processes. The WQTF should continue to investigate these issues.
- There are potential connections between the use of indicators in a CWA context and in ecosystem restoration programs. The work group and workshop will help draw out some of these connections and issues.
- There is a need to bring the discussion regarding biological indicators to a broader audience, both in terms of across programs and at multiple levels within agencies.

Hokanson added that it will also become important to consider how biological indicators fit into UMR monitoring programs, both at a practical and policy level.

Sullivan asked whether, in the absence of consistent approach for the UMR, states would likely implement a biological approach independently. Hora and Olson indicated that their states would not likely proceed without a UMR-wide approach. Olson added that it might be possible to use different methodologies for intrastate waterbodies and for the UMR. Baumann observed that it may be easier to start with a "new" approach for the UMR, rather than trying to adapt existing approaches. Smogor commented that, if an approach incorporating the biological condition gradient were to be employed, it would be important to reflect this in state water quality standards. Olson again noted that it may be necessary for the states to develop a UMR-specific assessment methodology. Pearson added that it is important to foster collaboration across agencies in such an effort. Baumann observed that this discussion illustrates the types of issues that the WQTF needs to address in relationship to the potential application of biological indicators on the UMR.

In regard to the indicators workshop, Baumann suggested that participants would include: workshop organizers, workshop presenters, practitioners, program managers, implementers, and others. Garretson suggested that a representative number of NGOs be included. Olson added that field station personnel and fisheries experts would need to be included. Baumann asked Hora if MPCA and MN DNR would both need to be included. Hora replied that both agencies would likely be involved. Olson indicated that only Iowa DNR would need to participate in such a workshop, but that other agencies will need to be advised of workshop outcomes. Short noted that multiple agencies in Illinois should be involved. Dkhili indicated that Missouri DNR would be involved, but was not sure about other Missouri agencies. Sullivan noted that Wisconsin DNR is the one Wisconsin agency to include.

Designated Uses for the UMR

Smogor observed that the preceding discussion may be relevant for the consideration of designated uses for the UMR, in that the biological condition gradient could be applied within each of the aquatic life use areas being considered (main channel, side channel, isolated backwater, etc.). He noted that the same conceptual goal might then be expressed differently within each of the areas. He added that, since the states' CWA programs are "locked in" to CWA goals and concepts, it is important to keep the biological condition gradient approach in mind when discussing designated uses. Baumann concurred that this would be an important consideration in moving forward on UMR designated uses.

Baumann reminded the group that, in its earlier discussions, it had reached a consensus that there are different habitat-related strata in the UMR that need to be considered in refining designated uses for the UMR. Sullivan observed that it would be important for individuals with extensive knowledge of river data to work on the designated use project at this point.

Olson asked whether Illinois EPA has developed tiered aquatic life uses within its programs. Short replied that this process is underway.

Pearson commented that initial work by Andy Bartels suggests IBI scores may not be that different between the main channel and backwaters. Bolgrien added that, in any write-up regarding work on the designated uses project, it will be important to state up front what has been agreed upon so far. Pearson noted that fish and macroinvertebrate indices being developed indicate a clear distinction between impounded and unimpounded reaches of the river.

Interstate 305(b) Assessment and 303(d) Listing Consultation

Minnesota
Hora indicated that Minnesota's 2008 303(d) list was completed and approved, with work on 2010 list already underway. He added that nitrogen might be an emerging issue for the 2010 list.

Wisconsin
Baumann indicated that Wisconsin's 2008 303(d) list has been submitted to US EPA for review and that, while US EPA had raised some questions in regard to the list, none of them pertains to the UMR. Sullivan asked whether the PFOS listing on the UMRBA's chart summary was correct for Wisconsin, noting that the listing in the segment between the Chippewa River and Lock & Dam 6 may not be correct. Baumann indicated that he would confirm this and supply any corrections to Hokanson. [Note: Baumann later confirmed that this segment should not be listed with an impairment related to PFOS at this time.]

Iowa
Olson reported that Iowa's 2006 303(d) list was approved by US EPA in July. He noted that the only new impairment for the UMR was the addition of an aluminum impairment that was based on data provided by Illinois.

Olson added that Iowa has begun work on its 2008 303(d) list, and that this list will be the first to incorporate the "rebuttable presumption" that all water bodies can support primary contact recreation uses. He noted that a draft of Iowa's 2008 list was included in the handout he provided.

Olson raised one additional issue relevant to 303(d) listings—i.e., how to consider invasive species in regard to impairment. He explained that US EPA Region 7 has most recently asked Iowa not to identify invasive species directly as an impairment, but rather the impact of the species—e.g., suspended sediment and algae increases due to common carp, rather than the common carp *per se*. All other states indicated that the guidance they have received from US EPA on this matter is not clear.

Illinois
Short indicated that the chart developed by UMRBA appears to accurately reflect Illinois' listings. He indicated that Illinois' 2008 303(d) impairment list is currently at US EPA Region 5 and that the Region has objected to some of the decisions made by Illinois on the grounds that standards are not in place to support all of the listing decisions. Short noted that Illinois is no longer listing dissolved oxygen (DO) as pollutant, but rather listing the impairment in terms such as biological oxygen demand, as this is something more amenable to TMDL development. He indicated that use of new DO and sulfate criteria, which are not yet in standards, are part of this issue being raised by US EPA regarding the list.

Olson observed that a state's use of criteria not approved by US EPA can hold up approval of a state's list. Hora indicated that Minnesota has not encountered objections from Region 5 in using "numeric translators" of narrative criteria. Smogor observed that the US EPA typically does not raise this type of objection unless the new criteria may lead to de-listing, as is sometimes the case in Illinois, particularly in regard to siltation. Hora concurred that Minnesota has seen objections from Region 5 in such cases. Overall, Baumann observed that approval of new listings is generally much easier than approval of de-listings. Smogor said this creates a disincentive for states to look at new criteria and new contaminants. Hora noted that, as research regarding PFCs evolves, the associated criteria could change and potentially raise the same issues.

Missouri

Dkhili confirmed that UMRBA's chart for 2008 reflects what has been submitted to Missouri's Clean Water Commission. In regard to Missouri's 2006 303(d) list, he indicated that US EPA Region 7 has added impairments for lead and zinc to the list, and that this revised list is now out for public comment. Franz asked whether it was likely that these impairments would also end up on the 2008 list. Dkhili responded that this was not clear at this point.

Hokanson asked whether Missouri is still pursuing a realignment of its assessment segments for the UMR to better match the minimum assessment reaches. Dkhili responded that this was Missouri's intent, but reminded the group that Missouri will actually add additional subdivisions in the reach around St. Louis.

Hora commented that Minnesota has asked US EPA that the state's PCB impairments be moved to Category 4b (which does not require a TMDL), because the product has been banned from production. He added that this approach puts some "daylight" between the list of impaired waters and the 303(d) list. Hokanson suggested that the UMRBA chart may need to be modified to note impairments where no TMDL is needed.

Dkhili asked whether Illinois could adopt Missouri's TMDL for PCBs on the UMR. Short replied that initial conversations with Region 5 indicated that Illinois could not adopt this TMDL. Hora and Baumann questioned whether Region 5 could reject a TMDL that had been approved by Region 7.

Dkhili asked whether Region 7's representation on the WQTF has been established. Franz and Hokanson indicated that it had not, but that they would continue to work with Region 7 on this issue.

Dkhili added that Missouri has dropped manganese from its standards.

Updated Assessment and Listing Survey

Hokanson indicated that Larry Shepard of US EPA Region 7 had suggested updating the UMRBA's "Assessment and Listing Survey" and that this effort had value beyond Shepard's interest alone. He asked that the WQTF provide any comments and updates to him. Hora provided Hokanson with written updates. Baumann indicated that Wisconsin was moving toward an integrated report, though the current report may be something of a hybrid and that information beyond the 303(d) list might be included.

Upcoming Issues for Assessment and Listing

Baumann referenced Hora's earlier comment that Minnesota may consider nitrogen for upcoming listing cycles. He added that Wisconsin is looking at updating its assessment methodology and that this may allow for a chance to reexamine methodology appropriate for the UMR. Hora offered to make Minnesota's "six sigma" approach to assessment and listing available to all interested persons.

Franz observed that, if nutrient criteria are developed for the Gulf of Mexico, they may affect programs and standards on the UMR. Baumann commented that this could perhaps be translated into loads for the UMR and tributaries, though he thought it would be difficult to establish upstream criteria to decrease a load downstream. Hora concurred with this observation.

Next Steps for the WQTF

Topics for Next Meeting
Baumann identified the following as likely topics for the WQTF's next meeting:
1) Update on Lake Pepin TMDL and associated work with SAV (Likely speakers: Norm Senjem, MPCA and John Sullivan, WI DNR).
2) Update on PFCs (Likely speakers: Andy Lindstrom, US EPA and Marvin Hora, MPCA)
3) NRC project report discussion
4) Designated use project progress and update
5) Further discussion of biological indicators/IBI
6) State updates and assessment/listing consultation
7) Update on SPARROW model
8) EMAP update/EMAP publications

Bolgrien noted that EMAP-GRE's "assessment" would be complete in approximately 1 year.

Hokanson noted that the indicators/IBI discussion may be affected by the potential for the UMR biological indicators workshop in early 2009. He suggested that the WQTF may want to consider meeting in conjunction with the workshop.

Franz and Baumann suggested that, if needed, Robertson's SPARROW update could be done as a conference call or webcast.

Next Meeting Date and Location
The WQTF decided consider the potential workshop dates of January 20-22, 2009 as likely next meeting dates, with a possible conference call before that time. Likely location of the next meeting would be the Quad Cities or Dubuque.

Other Items
Sullivan asked if it was possible to receive a list of current EMAP publications. Bolgrien and Pearson indicated that this would be possible.

Garretson noted that the McKnight-sponsored Mississippi River Water Quality Collaborative was considering a Washington, DC "summit" in February 2009 to make contact with lawmakers. She indicated she would keep the WQTF updated regarding this effort.

Hokanson asked whether the WQTF was interested in more routine involvement from USGS in WQTF meetings and discussions. Baumann suggested that this involvement could range from information sharing, to participation in meetings, to membership on the WQTF. Naramore indicated that she and Hokanson would work with Baumann to identify the most appropriate and effective way of integrating USGS into the WQTF's work.

Sullivan commented that Jim Fischer (WI DNR) has been working on some of the reach-specific objective-setting efforts related to ecosystem restoration programs. Baumann indicated that he, Sullivan, Franz, and Hokanson should investigate this effort further and report back to the WQTF.

The meeting adjourned at noon on October 9, 2008.